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STUDIES IN EDUCATION

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1. Development of Ability in Research -
Carruths - - - - - p. 85
2. Needed Research in Higher Ed. Kelly p.
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THE NATIONAL SOCIETY
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COLLEGE TEACHERS OF EDUCATION

STUDIES IN EDUCATION

YEARBOOK XV

Consisting of papers by

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CHARLES H. JUDD	FLETCHER F. SWIFT
CLIFFORD WOODY	

Presented at the Washington Meeting

EDITED BY
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By

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¹ Joint program with Educational Research Association.

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TEACHER-TRAINING

I. REPORT OF THE CURRICULUM COMMITTEE OF THE NATIONAL SOCIETY OF COLLEGE TEACHERS OF EDUCATION

W. W. Charters, Chairman

In September, 1924, a committee of the National Society of College Teachers of Education was appointed with the following functions: (1) To summarize the general principles which should govern the determination of the curriculum for teacher training. (2) To initiate and supervise one or more specialized studies in job analysis within some restricted field of teacher training.

Since no money was available for meetings, it became necessary to depend upon correspondence for the work of the committee. Consequently each member was asked to frame a statement of the principles and methods involved in the solution of the problem. When these statements were found to differ in terminology and point of view, a meeting was held in February, 1925, in connection with the annual meeting of the Society. The result of this meeting was that one of the members was asked to frame a competent statement that would reconcile the terminologies and points of view of the members of the committee. At the present time this seems to be an impossible task.

While the College Teachers of Education has not had the funds provided for the study which were mentioned in the original assignment, money has been made available by the Commonwealth Fund for such a study under the direction of one of the members of the committee.

For the present year this study deals with an analysis of the duties of elementary and high-school teachers. The classification of duties is now being carried on, and an analysis of the traits of teachers will be made during the year. It is expected that by Octo-

ber, 1926, a master-list of duties and traits of elementary and high-school teachers will be available for the profession.

Your committee is of the opinion that it can better frame a statement of methods and principles after the present experimental study is finished and made available as a basis for the discussion of methods and principles. The committee therefore asks to be continued for another year.

March 6, 1926

II. SPECIALIZED CURRICULA IN TEACHER-TRAINING

M. E. Haggerty

We have been trying for a half-dozen years at Minnesota to develop specialized curricula designed to train students for particular educational positions. The liberty of the University to confer a teacher's certificate on its graduates is limited to the extent that the recipient must have earned a Bachelor's degree and a minimum of fifteen semester hours of work in education, the latter to include special methods and practice teaching. There is implied, although not designated in detail, general course work in content subjects pertinent to the nature of the certificate. Particularly is this true for certificates in agriculture, music, home economics, physical education, and similar special fields.

From the standpoint of curriculum-making these special fields call for no fundamentally different principles of procedure than do the academic subjects such as English and mathematics. Our conception has been that every student in the College of Education is preparing for a particular kind of work and needs the specialized training that will make him an efficient workman. He is not going to be an instructor in general; he is going to teach a particular kind of subject matter to particular kinds of children in schools of determinable character; or he is preparing to supervise the instruction of other teachers, or to administer a school system, or to become a school psychologist.

In pursuance of this conception our next college bulletin will provide thirty-five different curricular programs, any one of which will lead a student to a Bachelor's degree and to a legally valid certificate which carries a designation as to the curriculum completed (Table I).

It is the purpose of this discussion to set forth some of the principles basic to the formulation of such specialized curricula and some of the problems which we have met in trying to realize them.

It may be noted that the form of our university organization

has permitted us to proceed upon two assumptions: first, that the formulation and administration of any teacher-training curriculum is a function of the faculty of the college of education; and second, that all the resources of the university, in whatever school or college located, are available for the training of teachers. In developing any curriculum our limitations have not been lack of freedom, of facilities, or of co-operation so much as a limitation of our own

TABLE I

SPECIALIZED CURRICULA

1. Administration and Supervision	19. Natural Science
2. Agriculture	20. Norwegian
3. Animal Biology	21. Nursing Education
4. Art Education	22. Occupational Therapy
5. Botany	23. Physical Education for Men
6. Business subjects	24. Physical Education for Women
7. Chemistry	25. Public School Music
8. Elementary Teaching	26. Physics
9. English	27. Political Science
10. French	28. School Psychologist
11. Geography	29. Social Studies
12. German	30. Sociology
13. High School Administration	31. Spanish
14. High School Teacher-Training	32. Swedish
15. History	33. Teaching Subnormal Children
16. Home Economics	34. Trade and Industrial Education
17. Latin	35. Visiting Teacher
18. Mathematics	

knowledge in regard to the essential and desirable character of a curriculum itself. To discover this has called for more energy and ingenuity than we have yet been able to muster for even a single field. Such arrangement of courses as are announced in the college bulletin are to be regarded, therefore, as tentative proposals designed to meet the immediate necessities of training while we search through trial and investigation for the means of their improvement.

TRAINING MUST BE PROFESSIONAL

It is important, in undertaking the formulation of a teacher-training curriculum, that it be conceived as a professional, rather

than as an academic, curriculum. This principle, which is easy of statement, is difficult of application, particularly in a university community, and instructors in education are by no means free from its violation.

Academic education aims to provide the learner with a body of knowledge logically consistent in itself; it is interested in learning as such. Professional training is designated to fit men for service in a field where knowledge is put to the test of practical usefulness. The end of the professional student's training is not the possession of a body of knowledge; it is that he shall be fitted to perform efficiently the duties of a particular kind of position. As a professional student he is interested in information that he can use, in that which will make him a better workman. The object of his training is not to make a cultivated man; the purpose is to prepare a competent and expert servant of society. Only that study and training is professional which contributes to this outcome.

Certain inferences must be made from this principle. It follows that curricular content must be determined from the end backward, so to speak. The task which the learner at the end of his training is to perform is the criterion against which every item of the curriculum must be measured. That which is ultimately useless must be rejected, however interesting in itself or however desirable in a rounded body of knowledge. A fact of psychology which enables the learner to do better his ultimate task as a school worker shall be included; such a fact is educational psychology, from whatever source it may derive. Psychological facts which cannot be so used are but indirectly useful in the schoolman's professional curriculum. A history of education that enables a man to organize, administer, supervise, or teach a school better is suitable material for the professional curriculum. All other history of education is academic and is no legitimate part of the professional curriculum.¹

It further follows that a complete teacher-training program must provide as many specialized curricula as there are educational jobs that are fundamentally unique in character. Just here the application of the principle gives us pause and sets innumerable

¹ M. E. Haggerty, *Training the Superintendent of Schools*, Educational Research Bulletin No. 17, Vol. XXVIII (University of Minnesota, April, 1925).

problems for investigation. What are the fundamentally unique tasks in education of sufficient scope to justify a training program? The teaching of agriculture is clearly different from instruction in Latin, and being qualified as a teacher of mathematics certainly does not imply fitness to be a school psychologist. Some other matters are not so clear. What is the task which is set by education for a teacher of English and to what degree may a teacher whose training is largely in science qualify for the position? Does a teacher of history need any special training different from the teacher of

TABLE II

PROBLEMS STUDIED

1. The annual demand for new teachers.
2. Teaching assignments of high-school teachers.
3. Relation of teaching assignments to training.
4. Worker's activities in the assigned field.
5. Essential knowledge needed.
6. Extra-teaching functions of the teacher.
7. Teacher's training affected by equipment, library, and laboratory facilities in the schools.
8. Undeveloped functions requiring new elements in training.
9. School curriculum basic to training curriculum.
10. Instructional techniques affecting teacher training.
11. Extension of training during service.
12. Different types of junior-college training as propaedeutic to senior-college professional training.
13. Levels of intelligence necessary for training program.
14. The training program and success in service.

Latin? To what extent is advanced training in content subjects necessary for the young teacher who finds himself assigned classes in widely divergent fields?

Crucial questions of this sort fairly bristle over the whole field of professional curriculum-making, and no man today is wise enough to give a final answer to one one-thousandth of them, even though some of our "experts" essay to do so while standing on one leg. Their implication is a program of fundamental research that will lead into schoolrooms of all sorts, into the details of expert teachers' activities, into the activities of pupils, into the aims of education, and into the fundamental psychology of learning. Such a program is not the work of one individual, or of one institution, or

of one generation even. It is not impossible, however, nor even difficult to push back somewhat the limits of ignorance in these matters, and while formulating our curricula we have initiated investigations designed to improve them and have carried some of these studies through to completion.

These investigations have thus far sought to answer fourteen major questions which seem to us directly related to our problems of curriculum-making (Table II). This is not the place for a complete discussion of results, but a brief statement of method may be attempted. Because of the character of our institution it is recognized that our primary obligation is to the state of Minnesota. These studies have therefore been oriented to the specific needs of the schools of this state.

Problem 1.—The first question to be faced in providing a specialized teacher-training curriculum is the matter of demand for teachers of the particular training indicated. Mr. MacLean in 1919 made an initial study² of the supply and demand for teachers for all levels of public schools in Minnesota, and has repeated the study annually since that time. This study gives the number of rural, elementary, and high-school teachers needed in the state each year and thus indicates the number of graduates that should be forthcoming annually from the training institutions. On our own part we have supplemented this study with a detailed examination of the requirements in each of the fields in which the University of Minnesota might rightfully be expected to provide the supply. This study,³ based upon an examination of the records in the state department of education, was first made in 1921-22 and has been repeated for two later years. It covers every educational position in the public schools of the state and reveals the numerical distribution of the teaching population of the state among their several specialties. As a result we now know the number of teachers employed in Minnesota schools for each subject, the portion of time they give to that subject, and the number required annually to meet the demand (Table III). This is basic information for the provision of specialized curricula.

² R. B. MacLean, *Demand and Supply of Trained Teachers in Public Schools of Minnesota*, Master's thesis, 1921.

³ M. E. Haggerty, unpublished study.

Problem 2.—Not only is it desirable to know the number of individuals needed in each field, but the character of their teaching assignments is also important. Inasmuch as our graduates largely begin their teaching in smaller schools, they face the necessity of teaching more than one subject. It is imperative, therefore, that the annual demand be stated in terms of subject combinations. The

TABLE III

New teachers* for 1923-24 in high-school academic subjects, showing for each subject the number of individuals, total time equivalent, index number (total time equivalent, total number individuals), full- and part-time teachers.

SUBJECT	TOTAL NUMBER OF SUPERIN- TENDENTS, PRINCI- PALS, AND TEACHERS	TOTAL TIME EQUIVALENT		INDEX NUMBER		FULL TIME	PART TIME
		High School	High School De- partment	High School	High School De- partment		
Biology.....	59	10	6	.27	.24	0	59
Botany.....	7	.5	1.5	.18	.23	0	7
Chemistry.....	72	21	6.5	.39	.34	0	72
Economics.....	35	5.5	2.5	.22	.2	0	35
English.....	174	63.5	33	.6	.47	34	140
French.....	30	7.5	2	.35	.18	1	29
General Science..	102	19.5	9	.30	.22	3	99
German.....	4	.5	1	.25	.30	0	4
History.....	144	34.5	19.5	.39	.32	9	135
Latin.....	55	11.5	8.5	.38	.32	2	53
Mathematics....	116	26.5	16.5	.40	.31	7	109
Physics.....	46	11	2.5	.30	.20	0	46
Political Science..	5	1	.5	.17	.25	0	5
Psychology.....	1	.....	.5	0	.20	0	1
Scandinavian....	3	.5	.5	.22	.25	0	3
Social Science....	25	4	2.5	.27	.20	0	25
Spanish.....	14	3.5	.5	.29	.12	0	14
Zoölogy.....	11	1.5	1.5	.31	.26	0	11
Total.....	903	222	114.5	.....	.....	56	847

* New teacher is one whose high-school teaching experience is zero on the state high-school report.

trends of practice in this matter are indicated by the requests of superintendents to the bureau of recommendations. The study of the state department records already mentioned gives the complete picture of actual practice in the state. These records provide the programs of individual teachers, showing the actual combinations that teachers must meet, and impress more strongly than do the appointments records the fact that in all Minnesota high schools, except the larger ones, teachers do not teach a single subject, that their assignments scarcely follow any fixed rule, and that the range

TABLE IV
PROGRAMS OF SCIENCE TEACHERS

1.	Chemistry	Chemistry	Physics	Algebra	Algebra	Biology	Geometry
2.	Assembly	Assembly	Physics	Laboratory	General Science	Assembly	
3.	Physiology	Biology	Laboratory	Physiology	Biology	Laboratory	
4.	Chemistry	Laboratory	Physiology	Chemistry	Chemistry	Chemistry	Physics
5.	Chemistry	Chemistry	Algebra	General Science	Plane Geometry	Physics	Physics
6.	+ Latin				Algebra	Laboratory	
7.	Ancient History	Biology		Library		{Physics Library}	{Ancient History Psychology}
8.	+ Ancient History					{Physics}	
9.	+	Economics	Home	General Science	Physiology		
10.	Home	Home	Economics	Home		Chemistry	Chemistry
11.	Economics	Economics		Economics		Laboratory	
12.	Biology	Biology	Chemistry	Physics	Physics	Arithmetic	Chemistry
13.	Chemistry	Chemistry	Physics	General Science	Zoology	Chemistry	General Science
14.	Zoology	Elementary Science	General Science	Physiography	General Science	Elementary Science	
15.	General Science	Geometry	Algebra	Ancient History	Assembly	Assembly	Commercial Arithmetic
16.	Physics	Laboratory	Agriculture	Agriculture			Assembly
17.	+	Chemistry	Chemistry	Algebra	Algebra	Chemistry	Chemistry
18.	+						
19.	Assembly	Geometry	Algebra	Physiography	American History	Physics	{Physics Laboratory}
20.	Chemistry	Chemistry	Physics		General Science	General Science	Physiography
21.	+	Geometry		Physics	Laboratory	Economics	General Science
22.	General Science					General Science	

and diversity of assignment is such that college curricula can scarcely provide adequately trained teachers for the public high schools as these schools are now administered. The chaotic situa-

TABLE V*

PERCENTAGE DISTRIBUTION OF THE SOCIAL STUDIES TO SHOW THE EXTENT TO WHICH THEY APPEAR SINGLY AND IN COMBINATION IN EACH GROUP

SUBJECTS	NUMBER OF TEACHERS	PERCENTAGE OF TIMES EACH SUBJECT APPEARS						
		As a Single Subject	In a 2-Subject Combination	In a 3-Subject Combination	In a 4-Subject Combination	In a 5-Subject Combination	In a 6-Subject Combination	In a 7-Subject Combination
<i>History:</i>								
Group I.....	32	43.8	40.5	15.6	.....	.....	.....	.....
Group II.....	55	14.5	38.2	27.3	14.5	3.6	1.8	.....
Group III.....	89	4.5	20.2	43.8	22.8	5.6	2.2	1.1
Group IV.....	51	.....	15.7	31.4	27.4	17.6	5.9	2.0
<i>Political Science:</i>								
Group I.....	11	.....	54.6	45.4	.....	.....	.....	.....
Group II.....	29	3.4	37.9	24.1	27.6	3.4	3.4	.....
Group III.....	44	.....	6.8	36.4	38.6	11.4	4.6	2.3
Group IV.....	19	.....	.....	21.1	36.8	36.8	.....	5.3
<i>Economics:</i>								
Group I.....	9	.....	33.3	66.7	.....	.....	.....	.....
Group II.....	19	.....	31.6	21.1	31.6	10.5	5.3	.....
Group III.....	24	.....	8.3	41.7	29.2	16.7	4.2	.....
Group IV.....	12	.....	.....	16.7	16.7	50.0	8.3	8.3
<i>Sociology:</i>								
Group I.....	7	42.9	28.6	28.6	.....	.....	.....	.....
Group II.....	12	.....	33.3	8.3	41.7	8.3	8.3	.....
Group III.....	20	.....	15.0	35.0	30.0	15.0	.....	5.0
Group IV.....	14	.....	.....	14.3	35.7	50.0	.....	.....
<i>Social Science:</i>								
Group I.....	43	62.8	32.6	4.7	.....	.....	.....	.....
Group II.....	69	42.1	37.7	13.1	7.3	.....	.....	.....
Group III.....	112	12.5	32.1	40.2	11.6	2.7	.9	.....
Group IV.....	66	.....	22.7	36.4	27.3	9.1	4.5	.....

* P. W. Hutson, "High-School Teachers of the Social Studies: Their Training and the Subjects They Teach," *Journal of Educational Research*, IX (1924), p. 97.

tion may be gleaned from the programs of sixty teachers of science⁴ taken in order from the high schools standing first in an alphabetical list of towns. These programs do not reveal a single full-time teacher of chemistry, and show further that the teacher of science may also be required to teach the most diverse of high-school subjects, such as history, English, Commercial Law, and Latin, as well as all other kinds of natural science (Table IV).

⁴ Reported by S. R. Powers, "The Training of Science Teachers," *General Science Quarterly*, VIII (1924), 481-96.

Problem 3.—To what degree are teachers in the schools assigned in accordance with their college training?

Studies by Mr. Hutson⁵ on conditions in Minnesota, Pennsylvania, and California not merely support this picture of variegated teaching assignment in high schools, but they further show that such assignments have frequently little relation to the college training of the teacher. Whereas each of the social studies appears as a combination subject in more than two-thirds of the schools studied,

TABLE VI*

PERCENTAGE DISTRIBUTION OF THE 172 TEACHERS OF SOCIAL STUDIES ACCORDING TO THE NUMBER OF FIELDS IN WHICH THEY HAVE AT LEAST SIX HOURS OF COLLEGIATE TRAINING

Number of Fields	College Graduates (88)	University Graduates (84)	Total (172)
0.....		1.2	.6
1.....	19.3	14.3	16.9
2.....	31.8	23.8	27.9
3.....	26.1	28.6	27.3
4.....	21.5	22.6	22.1
5.....	1.1	8.3	4.7
6.....		1.2	.6
Totals.....	99.8	100.0	100.1

* P. W. Hutson, Doctor's thesis (December, 1925), p. 54.

and almost always so in the smaller schools, it appears that only about one-half (54.6 per cent) of the teachers have training in as many as two of the studies which are taught (Tables V and VI). Similar conditions are revealed in English and science.

The university can do little to meet this situation as far as the training of the teachers is concerned. It can make use of this information in training a prospective superintendent of schools.

Problem 4.—What are the skills which teachers practice in their daily work?

Problem 5.—What is the essential knowledge requisite to the proper employment of these skills?

⁵ P. W. Hutson, *Training of the High-School Teachers of Minnesota*, Educational Monograph No. 3, 1923; *The Special Preparation of High-School Teachers for the Subjects They Are Teaching*, Doctor's thesis, 1926; "High-School Teachers of the Social Studies: Their Training and the Subjects They Teach," *Journal of Educational Research*, IX (1924), pp. 97 ff.

If we would plan intelligently the content of a teacher-training curriculum, it is necessary to deal in finer instructional units than are denoted by the names of school subjects or even by the large divisions of such subjects. English is a term of varying connotations, and, when undefined, is always ambiguous. So are all similar terms. The teacher of English in the course of the day's work does certain things, practices definable techniques and skills, makes use of particular bits of knowledge. We must know what these are in objective and describable terms before we can set them as ends to be achieved in the training of a teacher of English. Just because these skills and knowledges are different for the teacher of any other subject we must study separately the teacher of history, the teacher of science, or the teacher of agriculture.

The adequate occupational analysis of educational positions is a large problem, and we can make no pretense to any great contribution. We have, however, projected some studies in the field with a view to modifying our own curricula. The investigations by Miss Inglis⁶ in the field of English teaching and that in industrial arts by Mr. Smith⁷ may be cited for illustration. Each of these investigators has spent a large part of a year in the field visiting teachers in the classrooms and after school hours, with activity schedules at hand.

In the pursuit of his problem Mr. Smith visited sixty-five Minnesota towns, which is one-third of those maintaining industrial courses for boys. Miss Inglis visited fifty high schools. The selection in each case was so made as to be representative of the state as a whole and thus provide the field picture basic to our training program. The fundamental questions which each sought to answer are of this type: What do successful teachers actually do in the pursuit of their daily and yearly tasks? What are their objectives? Under what physical conditions in the way of building equipment and library do they work? How is this particular work viewed by the superintendent of schools and board of education? With what kinds of pupils do they deal? What is the teachers' preparation for their specific tasks?

⁶ Rewey Belle Inglis, unpublished study.

⁷ Homer J. Smith, *Industrial Education in the Public Schools of Minnesota*, University of Minnesota bulletin, Educational Monograph No. 6, 1924.

Miss Inglis sought to learn the relative significance which certain tasks develop in the teacher's activities. She checked this against the teacher's judgment of her preparation for that particu-

TABLE VII
LITERATURE

LITERATURE	USE			PREPARATION		
	1	2	3	1	2	3
<i>Activities of the teacher herself:</i>						
Understanding ordinary prose when read silently.....	88	9	4	84	11	5
Tracing influence of authors upon one another.....	17	40+	41+	44	40	15
<i>Teaching or directing activities:</i>						
Training students to understand ordinary prose when read silently.....	71	28	1	49	19	22
Teaching students to trace influence of British writers upon American.....	2	24	76	18	37	44
WRITTEN COMPOSITION						
<i>Activities of the teacher herself:</i>						
Writing a well-organized piece of exposition.....	27	44	28	68	27	4
Criticizing students' work for effectiveness.....	69	29	1	38	32	29
<i>Teaching or directing activities:</i>						
Giving instruction and practice in writing exposition.....	52	42	5	56	29	14
Drilling students in correct grammatical usage.....	81	18	0	52	32	16
ORAL ENGLISH						
<i>Activities of the teacher herself:</i>						
Organizing material for an informal talk.....	41	43	15	51	31	18
Participating in formal debate.....	4	20	76	43	40	17
<i>Teaching or directing activities:</i>						
Training students' voices.....	12	46	41	27	34	48
Directing classroom dramatization....	18	44	38	21	34	45

lar task. She found, for illustration, that 71 per cent of the teachers testified that "training pupils to understand ordinary prose when read silently" is an activity of the first rank, while only 49 per cent indicated that they had received major preparation for this task. At the same time the teachers studied rarely found use for "training the influence of one writer upon another," even though 50 per

cent of them thought that kind of exercise had been a major activity in their own training (Table VII).

In similar fashion Mr. Smith studied the relationship between the industrial teacher's training and the use that he makes of that training. Where he found that the teacher had been schooled in a

TABLE VIII

THE RELATIONSHIP OF TEACHER PREPARATION IN INDUSTRIAL SUBJECTS TO
THE PRESENT USE OF THE TRAINING

COMMON INDUSTRIAL SUBJECTS	NUMBER OF MEN* WHO HAVE HAD TRAINING IN THEM			HOW THE TRAINING ACQUIRED IS MADE USE OF		
	In School	Through Contact	Either or Both	Have Taught	Now Teaching	†
Woodwork and cabinet-making...	101	7	105	92	89	.....
Mechanical drawing.....	95	3	96	87	75	.....
Wood-turning.....	78	1	78	11	21	L
Architectural drawing.....	64	2	65	34	20	L
Farm shop work.....	3	10	11	4	15	S
Auto mechanics.....	41	12	50	8	14	L
Forging.....	70	5	72	19	13	L
Electricity.....	43	8	49	3	13	L
Printing.....	27	8	32	13	13	L
Machine Shop practice.....	56	12	61	15	12	L
Carpentry.....	38	57	84	7	12	L
Sheet metal work.....	11	■	12	11	10	.....
Machine design.....	27	0	27	7	7	.....
Pattern making.....	13	3	15	10	7	.....
Millwork, wood.....	71	7	76	6	7	.....
Home mechanics.....	5	0	5	3	4	.....
Foundry practice.....	18	3	19	2	4	.....
Arts and crafts†.....	50	0	50	13	4	L
Cement work.....	10	8	18	9	2	.....
Plumbing.....	24	4	25	0	0	L
Subnormal classes.....	0	0	0	19	21	S
Normal training group.....	0	0	0	35	37	S

* Base, 110 men interviewed.

† Weaving, basketry, art metal, clay-modeling, etc.

‡ L indicates latent preparation, and S, a shortage of training.

form of skill for which he had no use, he designated such training latent preparation. Such latent preparation he found in ten of twenty-two phases of industrial work. Three-fourths of all teachers interviewed had been trained in wood-turning, while less than one-fourth had made any use of this skill in teaching. On the other hand, only 3 per cent had been trained in farm shop mechanics, although a very large percentage had use for such knowledge in teaching (Table VIII).

A mere catalogue of overt activities does not, however, indicate all the essentials of a training program. Only indirectly does it reveal the essential knowledge, as distinct from skill, which the teacher must possess. What information, general and special, does he need? Both Mr. Smith and Miss Inglis have sought to throw light on this matter.

Mr. Smith, in his published report, lists 246 concepts—objects, materials, qualities, processes, mechanisms, machines, and human relations—which the industrial teacher should teach to pupils and which must, therefore, be found in the teacher's own training curriculum. Many of these concepts, ranging from such simple things as the properties of glass to the national importance of a particular industry, are analyzable into complex systems of ideas requiring extended study for their mastery. The effect of such an analysis is to give an entirely new picture of the teacher of the industrial arts and to provide greatly modified implications for his training. In the perspective of this study the two-year curriculum for training industrial arts teachers appears entirely inadequate. The job is far too comprehensive to be trained for in so short a time. It now appears to be a major task in secondary teaching and must be so conceived for the purpose of teacher training.

Miss Inglis, in her study of the work of the English teacher, has similarly sought to describe the specific knowledge which such a teacher actually uses for the instruction of high-school pupils. She provided exhaustive checking lists and asked teachers to note the usefulness of each item under several categories of importance. As might be expected, she found that aside from the general survey in rhetoric and literature the college course listed as most useful in the English teacher's high-school work is that in Shakespeare. Next to it stands American literature, and then comes grammar. In a weighting scheme which gives the survey course 198 points and Shakespeare 193, grammar received 158. By the same measure Old English scored 36; dramatic technique, 31; and versification, 24. The latter courses are frequently given much time in the English teacher's training, while grammar is neglected. The high score which it receives probably does not mean that high schools are spending much time on formal grammar as such, but that the

teacher finds she must use the rules and terminology of grammar constantly in her daily work.

The implication of such information as has been derived by Miss Inglis and Mr. Smith for the modification of the training program would seem to be plain.

Problem 6.—It should be clearly recognized in the training program that there are extra-teaching functions to which an instructor or administrator must give some time. Although school practice is frequently unsatisfactory in this matter, some such obligations are inescapable. What are these obligations for the teacher of history, the teacher of English, the teacher of industrial arts, the superintendent of schools? If the answer to these questions could be stated in terms of stable and permanent practice we would have the basis for defining a training program in these extra-teaching functions.

Some information we have or are collecting in three fields. Mr. Smith found that 110 teachers of industrial arts engage in twenty-one school activities aside from teaching the subjects for which they are employed. These activities range from the installation of school equipment to directing orchestras and athletic coaching, the latter being a common offender against a consistent program. More than half of these activities have no obvious relation to industrial arts.

Some extra-teaching functions are however pertinent to the teaching assignment. Thus the teacher of English may properly, under some conditions, assume responsibility for the school library, the school paper, dramatics, and debate. Such activities are sufficiently related to the instructional work in English that if they are consistently assigned to her in the schools they may be made a part of the training program of prospective teachers for that field. Miss Inglis found, however, in her study of sixty English teachers, that they engaged in approximately twenty-five extra-teaching functions, only eight of which could be construed as in any way related to the teaching of English.

Mr. Selke and Mr. Peik have secured a list of more than thirty extra-administrative activities of the Minnesota school superintendent, probably one-third of which are intimately related to his

administrative problems, and another third of which closely concern his function as the educational leader of his community.

The time has passed in American education when these supplementary activities of the educationist can be ignored, either in actual practice or in training. There is needed a clearer picture than is now available of what they should be for the several school positions, a frank recognition of their importance, and a definite place in the training program for instruction in them.

Problem 7.—Similarly, the work of a teacher is conditioned by the physical conditions he meets, and the training program should take account of this fact.

Minnesota high schools with an enrolment under 250 pupils, visited by Miss Inglis, have a high-school library with a part-time teacher in charge. This library contains approximately one thousand books, about one-half of which relate to English work. It contains a card catalogue, but has no reader's guide or other index. It subscribes to the *Literary Digest*, the *Outlook*, the *National Geographic*, the *Review of Reviews*, the *World's Work*, and a small miscellany of other magazines, but it has no files of pictures or clippings.

This type of school has a study hall with an approximate seating capacity of 180 stationary desks. It has no stage, no dressing rooms, no organ, no gallery. It has a piano and a lantern, but it has no means of darkening. These facts suggest obvious limitations upon what a teacher of English may do in these schools, and there are definite implications as to necessary training of the student teacher to adapt her work to the kind of school she will meet.

Data similar to this for English, Mr. Smith has collected for industrial arts, and we should have it for every important field.

Problem 8.—An important criticism lodges against the adequacy of an occupational analysis which is based upon actual practice in a particular field, namely, that that practice itself may be inadequate. It is important for the investigator to go beyond what he finds to a consideration of the larger situation. He must be concerned with what practice ought to be as well as with what it is. An illustration we have at hand in the relation of the superintendent of schools to the training of inexperienced teachers.

The selection and training of a teaching corps is one of the superintendent's choicest privileges and a most serious responsibility. Standards of certification and teacher training in Minnesota have done much to solve this problem for the Minnesota superintendent. More and more these standards eliminate the intellectually unfit and the untrained from competition for place. Still, within the group of those who meet all the requirements for certification, there are wide ranges of capacity for success in teaching. It is necessary to admit that teachers' colleges still graduate and certificate students who do not succeed in teaching, and that our technique for predicting success is defective. Among those who qualify in the legal and technical sense, the superintendent is called upon to choose those who, in his judgment, meet the requirements of his school and community.

In the past there has been little, if anything, in the superintendent's training program designed to fit men for this task of selecting teachers. The advancement in personnel studies in recent years suggests that in the future something may be done.

The selection of individuals is but the first step in providing a satisfactory teaching corps. Let us in the training schools perform our function to the maximum of our abilities; inexperienced college graduates are still but apprentices at an early stage of training. Their perfection is the work of succeeding years and requires continued supervision and guidance. In some cases this continued guidance has been given by the college which has provided the undergraduate training. At Minnesota we do this "training in service" in agriculture and in home economics. Possibly we should extend it to some other fields.

It is the writer's judgment, however, that such "university extension," while temporarily ameliorative and helpful, is not a solution for the continued professional training of the great body of young teachers entering the elementary and high schools of the state. In the last analysis this is the task of the superintendent of schools. He should assume it as one of his major responsibilities, provide for it in the distribution of his time and resources, develop a definite teacher-training program for his staff, and carry it through with the same fidelity and thoroughness that he does the

education of the children themselves. We in the university must provide for the prospective superintendent the kind of training that will fit him for this work as a trainer of teachers.

Mr. Peik, a member of our department, undertook to investigate this question.⁸ He set himself to a study of what superintendents do and might do to continue the actual training of college graduates whom they employ. In approaching this problem he found a prior one, however, which he has spent the better part of two years in trying to reduce to objective description and evaluation, namely, What is the character of one of our college graduates in terms of useful habits and knowledge derived from the so-called "professional" courses?

As things have developed this question has assumed the proportions of a major investigation. Mr. Peik has analyzed into its elements the twenty-five quarter credits of educational work which we require of all students preparing to teach academic subjects. From this analysis he derived more than eight hundred separate topics which students are supposed to study and master in the course of their work. By painstaking technique he has sought to identify every item of information that enters into the student's professional training, to measure the time spent upon it, to number its repetitions during the two-year period, and thus to secure an accurate picture of the student's intended equipment at the time of graduation.

Incidentally, this study, by giving us a common insight into, and a comprehension of, our training program, provides our faculty data for some improvement of our present offerings. Its primary purpose, however, is to clarify for a superintendent just what he is employing in the way of a skilled workman. This he requires before he can proceed intelligently with a graduate's further training because such training in service must begin where the university course ends.

We need one further body of knowledge before we can use Mr. Peik's material in the training of a prospective superintendent, namely, a clear-cut picture of the Minnesota superintendent's job itself. This picture Mr. Selke is trying to make for us by an occu-

⁸ W. E. Peik, investigation in progress.

pational analysis.⁹ It is hoped that out of these studies we may be able to describe better than before the superintendent's function in teacher training and may make this material a basis for teaching the men who are to be Minnesota's future superintendents of schools.

Of similar value is a study by Professor Koos on the high-school principal,¹⁰ treating, among other matters, the principal's opportunity for administrative and supervisory activities and his responsibilities in more than a score of such functions.

Problem 9.—It may not be completely fair to shunt the whole problem of training in service to the shoulders of the superintendent of schools. By whom else and in what manner may it be done? By the state department of education, by teachers' associations, by the representatives of book and equipment houses, by the publishers of educational periodicals, or is the university itself to play a part in it? And if so, how? No complete answer to this question can be made. One short study in this field we have completed. In 1923, Mr. Dickinson made a survey of current practice in service training for teachers of agriculture.¹¹ From a questionnaire study of nation-wide conditions he described prevailing practices and projected a desirable program for future use, a program in which the university should play a major rôle.

Problem 10.—Mr. Dickinson has essayed a more ambitious task in another field.¹² One of the difficulties to be met in curricularizing the teacher's training is the vagueness surrounding the curricular content of the subject as it is taught in the schools. Where school curricula are inadequately stated and unstandardized the university is at a loss to know what content to require of prospective teachers. In certain cases it is necessary to go beyond the offerings now found in the schools to devise a technique for determining what that content should be.

This is the task Mr. Dickinson has undertaken. He has sought

⁹ George A. Selke, investigation in progress.

¹⁰ Leonard V. Koos, *The High-School Principal* (1924).

¹¹ Sherman Dickinson, *Training in Service for Teachers of Agriculture*, University of Minnesota bulletin, Educational Monograph No. 5, 1923.

¹² Sherman Dickinson, unpublished thesis for the doctorate.

to define a method by which the school content for a course in dairying could be determined. The study involved five steps, as follows: (1) The cataloguing of all the items in the field of dairying that might be regarded as possible topics for the school curriculum; (2) The evaluation of these several items by experts in the science of animal husbandry and by expert dairy farmers; (3) The formulation of a comprehensive objective examination for the purpose of measuring the dairy information of farm boys before and after the course in dairying; (4) A technique for determining the suitability of a course in dairying to a particular community; and (5) A technique of using the data obtained in the four steps thus indicated in the actual planning of a course in dairying for a particular community.

In a similar, but less thoroughgoing, fashion Mr. Armstrong¹³ undertook to determine the shop activities in which farmers and farm boys engage with a view to arranging the shop activities to be provided in the school shop training. Likewise Mr. Lathrop¹⁴ has studied the best practice of farmers to learn the desirable school content of a course in oat growing.

Such studies raise a host of related and sequential problems, but they concern us here as a means of reflecting upon the teacher-training program and indicating modifications in it.

Problem 11.—Just as curricular changes in the schools reflect upon the teacher-training program, so also do changes in methods of school instruction. The training institution is obligated to do two things in connection with this matter: (1) To keep in contact with important changes as these occur in the schools, and (2) to initiate and try out new instructional techniques that offer promise of improving school practice and therefore the service which a teacher may render. The magnitude of this problem is such as to induce great modesty, if not timidity, on the part of teacher-training institutions. Something, however, we have been trying to do in a variety of fields. Studies have been made in the teaching of the

¹³ F. E. Armstrong and F. W. Lathrop, *Farm Repair and Construction Work*, University of Minnesota bulletin, Educational Monograph No. 4, 1923.

¹⁴ F. W. Lathrop, "The Survey Method of Teaching Agriculture," *The Visitor*, Vol. IX (1923), No. 2.

high-school subjects of English, German, physics, mathematics, chemistry, general science, history, in the problems set by the differences of intellectual capacity of the pupils in the schools, and in certain teaching problems in the elementary school.

The variety of these studies¹⁵ precludes a digest here, but for illustrative purposes citation may be made of a study now in progress on the changes in teaching technique made desirable by the large class in first-year high-school English and in second-year mathematics. If increasing the size of class is not to induce decreased efficiency, there is necessitated the development of a technique of large-class instruction that can be taught to young teachers just entering the schools. The experiments now in progress give promise that such techniques are possible and that our training program can be modified to include them.

Problem 12.—A problem which we have shared with other senior college schools of education is the relative values of several types of junior college training on the capacity of education students to carry senior college courses. In particular we have been concerned to know if training in our own junior college had any superiority over that of the two-year normal schools or of the small colleges of our territory. We have allayed any fears that might have been entertained on this score by a study of the six graduating classes from 1918 to 1923, inclusive. The students preparing for academic high-school teaching were divided according to the kind of junior-college training which they offered at entrance as follows: (1) From the University of Minnesota junior college; (2) from smaller colleges, private and endowed; (3) from the

¹⁵ The following list suggests the character of these studies: Ada Burke Bing, "Measurement of Instruction in English Composition"; Brown and Haggerty, "Improvement in English Composition"; August Dvorak, "A Study of Achievement and Subject Matter in General Science"; L. D. Haertter, "Relative Effectiveness of Instruction in Large and Small Sections in Second-Year Mathematics"; Earl Hudelson, "Studies in the Teaching of English Composition and Literature"; Archer W. Hurd, "Subject Matter Versus Character Traits: I.Q. as Prognosis of Success in Physics"; Rewey Belle Inglis, "Progress in Acquiring Minimum Essentials in Minnesota High Schools"; A. C. Krey, "A Projected Nation-wide Study of the Teaching of History and the Social Studies in the Public Schools"; S. R. Powers, "A Diagnostic Study of the Subject Matter of High-School Chemistry"; W. D. Reeve, "A Diagnostic Study of the Teaching Problems in High-School Mathematics"; Dora V. Smith, "Relative Effectiveness of Instruction in Large and Small Sections in First-Year English."

Minnesota Teachers College two-year course; and (4) from teachers' colleges outside Minnesota. The records which these four groups of students made during the two years they were enrolled in the college of education were evaluated in terms of honor points on a scale where C, the median grade on a five-point scale was equated to 1; B, to 2; and A, to 3 (Table IX).

The results do not indicate any striking superiority for any of the four groups. Neither does any one group show marked deficiency. The junior college work offered by any one of the four types of institutions appears about equally effective to that of the

TABLE IX

Comparative records of students receiving a Bachelor's degree from the College of Education during a six-year period, 1918-23, arranged by groups according to types of institutions in which junior-college work was done.

Students Entering College of Education from:	Number of Cases	Average Honor Point per Credit Hour	Average Honor Point in Academic Subjects	Average Honor Point in Education Subjects	Average Honor Point in Major Subjects
College of S. L. & A., University of Minnesota.....	222	1.61	1.63	1.58	1.74
Minnesota normal schools.....	116	1.74	1.69	1.84	1.85
Colleges other than Minnesota. Normal schools outside Minnesota.....	139	1.63	1.61	1.7	1.77
	64	1.68	1.63	1.77	1.79
Total.....	541	1.65	1.63	1.7	1.78
S. L. & A. Senior College, 1923..	206	1.56	1.56	.....	1.65

others in preparing students for the work of the senior college, although the students from the two-year normal schools have a slight advantage.

This finding is supported by a study by Professor Miller of the record made by 565 students in educational psychology, a required course, where the marks are based on an objective final examination. In these results the teachers' college group again led, the state university group came second, the University of Minnesota, third; with all other institutions lower.

The only marked deficiency which either study shows is for the students coming from the Minnesota junior colleges.

Problem 13.—A question with which every curriculum is concerned is the intellectual quality of human material with which it must work. Thanks to the development of intelligence examina-

tions, we now have a means for a partial measure of the intellectual ability of our students. These tests we have been using since 1917, when Army Examination A was given to all students in the University of Minnesota. As a result we are certain that prospective teachers at Minnesota are a highly selected group, that the intellectual quality of college students preparing for teaching is the equal to that of those who are going into medicine and law, that it is better than that of those who are studying agriculture, dentistry, mining, or the regular arts course in the senior college.

An analysis by Miller and Distad indicates, however, wide ranges of ability for the students in the several educational specialties. In one curriculum only 10 per cent of students fall below the median intellectual level of the whole education group. In another curriculum there is not a student who rises to this same median level. Clearly the teaching problems in these two curricula are diverse. Were we to enforce the same intellectual standards for the second curriculum as now prevails for the first, we should simply eliminate that group of students from the University. Possibly this should be done, but it is not certain that such procedure would be wise. We have not sufficient evidence yet to warrant any final judgment. What is apparent are the clear-cut differences in the intellectual capacities of the several groups, and we can no longer proceed on the assumption of intellectual equality throughout the student body.

If we only knew how much intellect is required for a successful superintendent of schools, how much for a teacher of physics, how much for a teacher of music, a teacher of industrial arts, we could render far better vocational advice than is now possible, and it is to this end that such studies and analyses are being continued.

Problem 14.—Finally, it is important that any training institution keep careful check on the results of its work. How shall we know that what we do in the way of training really functions in successful teaching? We who preach so loudly that the results of teaching should be a criterion for evaluating the effectiveness of a school ought in all conscience to apply the test to our own work.

Two essays at this evaluation we have made. Professor Whitney in 1920 undertook to devise a technique for predicting teaching

success in terms of intelligence, secondary-school record, academic record in college, record in education courses, student teaching, and a rating for physique. With elaborate statistical technique he sought to evaluate these several items as predictive measures of success.

With a very different method Mr. Peik has sought to learn from the graduates themselves just how the several items of their training function in the first, second, third, and later years of their training. Let us illustrate by item 400 of his checking list, "Adapting Instruction to Individual Differences in Mixed Classes," an item which is definitely a part of our instructional program. Eighty per cent of all alumni reporting remembered that this topic was treated in the curriculum; 47 per cent testified that this treatment had been useful to them in their work of class instruction, 49 per cent had found it helpful in their educational thinking, and 26 per cent felt that the college treatment of the problem had been inadequate.

Similar data Mr. Peik had derived for each of the 861 items on his list, material which will be of inestimable value to the college in improving its program of instruction.

The list of specialized curricula here suggested and the research projects which they have presented to us are offered merely as illustrative problems in the university's field of training educationists. The curricula are not defended in detail; neither is it believed that the investigations offer finally satisfactory answers to the problems which they attack. It is further obvious that these are not the only problems presented for research, nor are they necessarily the most important ones. Our discussion has sought to illustrate two theses to which as an institution we seem committed: First, a professional school of education should not attempt to train teachers in general, but should define its teacher-training curricula toward definitely specialized positions in public education. Secondly, it should recognize the present limitation of knowledge as to what such specific curricula should be, and while it makes tentative adjustments of courses to meet immediate needs, it should continuously prosecute research looking to the improvement of such curricula.

III. THE UNDERGRADUATE CURRICULUM IN EDUCATION

Walter S. Monroe

During the scholastic year of 1924-25 a committee appointed by the Commission on Unit Courses and Curricula of the North Central Association secured from 162 colleges, universities, and other institutions in which teachers are trained, a statement of the following information for each course in education actually given during 1923-24 or 1924-25: (1) title; (2) length of course in weeks; (3) number of hours per week the class met in recitation; (4) author, title, and publisher of text or texts on which the course was based. Since a few of the 199 colleges and universities listed as members of the North Central Association do not offer courses in education, the 162 from which usable reports were secured represent not less than 85 per cent of the collegiate membership of the Association in which departments of education are maintained.

The analysis of this information revealed a number of interesting and significant things. Variation in the titles of courses having similar contents was very obvious. Even in the case of courses reported as being based on the same text, significant variations in title occurred. For example, Parker, *Methods of Teaching in High Schools*, was reported as the basic text for forty-six courses, but these courses represent eighteen different titles. An examination of the different texts reported for courses having the same title corroborated the conviction that "the title of a course in education is a very poor index of its content." There were a few titles, such as Educational Psychology, Methods (or Principles) of Teaching, History of Education, and School Administration, which appeared to represent a fairly consistent content, but there were significant exceptions in the use of even these terms. For example, when judged by the text used, Educational Psychology, History of Education, Principles of Secondary Education, Secondary Education, and Principles of Education appear in the list of courses classified as belonging to the field of general methods; General Methods,

Secondary Education, Principles of Education, and Principles of Teaching appear as titles of courses based on texts in the field of educational psychology.

The study of the titles of the courses and the texts on which they were based suggested the question, "How large is the field of education?" or stated more precisely, "Is the number of semester hours of education which an institution may offer on the undergraduate level essentially unlimited, or is there a limit beyond which a department may not go without having undesirable overlapping between courses or introducing subject matter of doubtful value?"

The number of semester hours of work offered by departments of education has been greatly increased since 1900. During the decade prior to 1900, history of education and educational psychology, or child study, as it was commonly called, began to be added to the traditional courses in pedagogy and school management. In 1897-98 Teachers College, Columbia University, offered nine courses in general education, seven in special methods, and eleven in the kindergarten department.¹ By 1905-6 the number of courses offered by this institution in general education had increased to nineteen. In 1924 Teachers College offered 203 courses.

Although no other institution offers so many courses in education, an elaborate array of offerings is typical of the announcements of many of the institutions that emphasize teacher training. Wilson² has reported the total number of hours of education announced in 1913-14 by thirty-two institutions, most of which are located in mid-western states. One institution (Grand Forks, North Dakota College) announced 131 hours, and another (University of Kansas), 129 hours. In the investigation for the North Central Association, which was based on courses actually given, a department of education in a relatively small institution whose primary function is not the training of teachers and which does not grant the Master's degree reported courses in education totaling 42 semester hours, exclusive of practice teaching and courses in

¹ I. L. Kandel, *Twenty-Five Years of American Education* (New York: Macmillan, 1924), p. 45.

² G. M. Wilson, *Titles of Courses in Education*, Educational Monographs, Society of College of Teachers of Education, No. 18 (1919), p. 13.

special methods. A few institutions reported even more extensive offerings of undergraduate work in education. The department of education in one state university reported forty undergraduate and graduate courses, totaling 107 hours, exclusive of special methods courses, practice teaching, graduate seminars, and thesis courses.

Consideration of the facts relative to the extensiveness of the courses offered by departments of education should convince anyone who is interested in the training of teachers that the question raised is not merely academic. When judged with respect to the number of courses offered, departments of education have undergone a tremendous expansion during the past quarter of a century, and there is evidence that the expansion is continuing. For example, an unofficial announcement for the 1926 summer session in one of our largest departments of education states that "twenty courses relating to curriculum problems" will be offered. If the field of education is essentially limited and new courses are being created largely by borrowing content from existing courses or by introducing content of doubtful value, the efficacy of our professional training of teachers will be affected. On the other hand, if the increase in the number of courses offered is merely an index of the development of the field of education, we will soon find it necessary to require a fifth year of professional training in order that a prospective teacher may have an opportunity to become acquainted with the essential phases of education.

Some of the causes of the rapid expansion of the field of education are obvious. The amount of knowledge about education has increased enormously since 1900. Many new topics such as supervised study, measurement of intelligence, measurement of achievement, individual differences, motivation, project method, educational diagnosis, educational guidance, and the like have been added. The field of school administration which in 1900 was confined to a single course usually designated as school management has been expanded into a pretentious array of courses. For example, the department of education of a mid-western state university reported that the following courses were given in this field during 1923-24 or 1924-25: (1) School Administration, 6 hours; (2) School Grounds, Houses, and Equipment, 3 hours; (3) Supervi-

sion of Instruction in Elementary Schools, 3 hours; (4) Advanced Work for Deans of Girls, 2 hours; (5) School Budgets and Accounts, 2 hours; (6) School Records and Reports, 2 hours; (7) Administration of Elementary Schools, 2 hours; (8) Public School Finance, 2 hours; (9) Part-Time Co-operative Education, 2 hours; (10) Vocational Counseling, 2 hours; (11) Organization and Administration of Vocational Education, 3 hours; (12) Development of Vocational Education, 3 hours; (13) Supervision of High-School Instruction, 2 hours; (14) Junior High School Problems, 2 hours; (15) High School Curriculum, 3 hours; (16) High School Administration, 3 hours:³ a total of 42 semester hours. In addition to the expansions in the field of general education we now have a number of specialized applications or phases represented by agricultural education, industrial education, adult education, rural education, and the like, which appear to be on the way to becoming co-ordinate divisions or departments.

An examination of the texts that form the basis of the undergraduate courses in education will tend to convince one that the actual increase in the number of topics and the amount of worthwhile information about them does not afford a sufficient justification for the degree of expansion represented by the courses now offered in many of our institutions. It appears that many instructors in the field of education have developed highly specialized interests. This is probably only a natural outcome of the emphasis placed on intensive study and research in their graduate training and the importance attached to research and productivity by colleges and universities. In many cases the development of a highly specialized interest has resulted in the creation of a new course with this interest as a nucleus. Thus we find courses having such titles as vocational guidance, mental hygiene, scout-mastership, story-telling, social education, municipal government, phonetics, the library in the modern school, citizenship, civic education, diagnostic teaching, individual differences, and the like. Many of the more ambitious instructors who have been permitted to offer a "new course" have recorded its content and offered the manuscript to a publisher who decided to publish it rather than to risk the

³ A separate course on secondary education is given.

possibility of the book being printed by a competing company. The appearance of a new book is frequently followed by the establishment of a new course in several departments of education, or at least by the modification of the content of an existing course.

The expansion of departments of education is an indication that the field is alive, that instructors in our colleges and universities are actively engaged in advancing the frontiers of our knowledge about learning, teaching, and the organization and maintenance of schools. From this point of view the present condition and what appears to be the trend of departments of education may be considered cause for gratification and self-congratulation. However, if the array of offerings of a typical department of education is studied from the point of view of the training a prospective teacher receives who elects 15 to 25 or 30 hours, subject to the restrictions of the institution, or better, if the groups of courses in education actually taken by prospective teachers are analyzed with reference to content, one will find much duplication and overlapping, and a surprising amount of subject matter whose value for the training of teachers does not appear to be consonant with the time devoted to it.

For example, one of the smaller state teachers' colleges reported six courses in educational psychology, as follows: Introductory Educational Psychology, Strong, *Introductory Psychology for Teachers*, 4 hours; Advanced Educational Psychology, Gates, *Psychology for Students of Education*, 2 hours; Adolescent Psychology, Hall, *Youth*, 2 hours; Child Psychology, Norsworthy and Whitley, *Psychology of Childhood*, and O'Shea, *The Child*, 2 hours; Psychology of Exceptional Children, Woodrow, *Brightness and Dulness in Children*, 2 hours; Psychology and Pedagogy of High-School Subjects, Judd, *Psychology of High-School Subjects*, 2 hours. Although a total of fourteen hours is offered, the courses do not form a sequence and an analysis of the texts will reveal a large amount of overlapping and some content of doubtful value. A private institution reported five courses in general methods based on the following texts: Waples, *Procedures in High-School Teaching*; Parker, *Types of Elementary Teaching*; McMurry, *Project Method*; Bennett, *School Efficiency*; Strayer and Engelhardt, *The*

Classroom Teacher; Burton, *Supervision and Improvement of Teaching*. Parker's text is apparently used in two courses given by different instructors. A college in Ohio offers two courses in general methods, both apparently being required. One is based upon Parker, *Methods of Teaching in High Schools*, and the other, called Supervised Teaching, upon Colvin, *Introduction to High-School Teaching*. In addition a course on school management is required, and one on educational psychology, using Gates, *Psychology for Students of Education*. Another college in this state reported a total of 64 semester hours, exclusive of special methods and practice teaching. None of the courses appeared to be graduate in character. The very large total is produced in part by excessive credit for certain courses. For example, 4 hours of credit is given for a course bearing the title How to Study, using Kitson, *How to Study Your Mind*, as a text. There are two courses of 3 hours each bearing the title Principles of Teaching; one based on Minor, *Principles of Teaching*, and the other on Bagley and Keith, *Introduction to Teaching*. In addition there is a 6-hour course on elementary methods based on a syllabus, and a 6-hour course on high-school methods. A course bearing the title Tests and Measurements, based upon texts by Hines, Terman, and Herring, is given for 6 hours of credit.

Although the cases just cited are not representative of institutions in the North Central Association territory, they are indicative of the expansions which have taken place in many departments of education. In a considerable number of institutions courses have been created which, when judged by the texts used, overlap to a distinctly undesirable degree one or more other courses given by the department. In several cases this appears to have been due to an attempt of an instructor to give a course on a topic like "individual differences," "motivation," "phonetics," or "vocational guidance." In order to provide a background for considering such topics, and perhaps to provide enough material to justify the course, the instructor has added subject matter from existing courses. In other cases, courses appear to be "padded."

Although one may be convinced that the present state of affairs is unsatisfactory, it is not easy to propose an effective remedy.

Our departments of education are called upon to provide training for a wide range of teaching, supervisory, and administrative positions. In addition to caring for the students who are working toward a baccalaureate degree, they are asked to provide instruction for teachers in service, especially during summer sessions. In institutions having a graduate school it is necessary to provide courses for an increasing number of graduate students. It is therefore obvious that the number of semester hours of work in education that an institution should offer will depend in part upon the function it is attempting to fulfill. However, it appears that for an institution attempting to fulfill a specified function there is a limit beyond which the addition of new courses, especially on the undergraduate level, is likely to result in undesirable overlapping or the inclusion of subject matter of doubtful value. This limit will vary with the combination of functions recognized by the institution and may advance somewhat as the field of education develops. The principle that, measured in semester hours, the field of education on the undergraduate level is limited rather than unlimited may seem to some to be unwarranted, but an extended consideration of the matter has convinced the writer of its validity.

Recognition of the principle that the undergraduate field of education is limited is probably more important than the determination of that limit in terms of semester hours, but in order to give the principle a more concrete meaning I shall risk the expression of an opinion concerning the maximum number of hours of education a department should offer on the undergraduate level. In the case of an institution that confines its undergraduate teacher-training efforts to the preparation of teachers for secondary schools, it appears that a limit in the neighborhood of thirty semester hours, exclusive of practice teaching and special methods courses, should not be exceeded by the courses open to undergraduates without careful inquiry concerning not only the intrinsic merit of the proposed course but also its relation to existing courses. When an institution recognizes other functions in addition to that of preparing teachers for secondary schools, the limit for undergraduate courses, exclusive of practice teaching and special methods, may need to be increased, but the amount of justifiable increase will probably be

less than may be assumed, since special methods courses are excluded in this estimate.

In suggesting a limit of thirty semester hours for the undergraduate course offerings in education in addition to practice teaching and special methods in institutions devoting their efforts to training teachers for secondary schools, I realize that I am by implication criticizing the organization of a large per cent, perhaps a majority, of the departments of education in our colleges and universities. This criticism may appear dogmatic and unwarranted, but consider what this thirty hours might include. Although there are certain persons who would abolish general courses in educational psychology and methods of teaching, the great majority of those who have had experience with the professional training of secondary teachers would include a course in educational psychology and one in general methods of teaching. To these courses there should be added a course dealing with the function of the high school, its organization and relation to the community and the curriculum. If each of these three courses were carefully planned with reference to the other two, overlapping being eliminated except where it appears to fulfill a useful purpose, a common terminology introduced, and a definite sequence required, it appears probable that 3 hours apiece would be adequate for these three courses.

History of education and school administration naturally occur to one as additional courses, but it may be noted that the latter relates to the duties of the administrator rather than the teacher. Classroom management and educational measurements are offered as separate courses in many institutions, but the former should be included as a phase of the course in general methods, and there is not enough material relating to educational measurements which is of common interest to high-school teachers to justify a separate course unless a setting is provided by introducing certain phases of the psychology of learning and general methods. Hence it is likely that the establishment of a separate course on educational measurements for high-school teachers will result in undesirable overlapping.

Without going into the matter further, it should begin to be apparent that if undesirable overlapping is avoided, a common

terminology employed in the several courses, and each course planned to sustain a definite relation to the others, ten courses with an average credit of 3 semester hours plus practice teaching and a group of special methods courses would constitute a very comprehensive array of offerings for undergraduate students preparing to teach in high schools. Few prospective teachers in institutions offering practice teaching and an adequate number of special methods courses would take more than 15 to 18 hours of the group of courses to which the 30-hour limit would apply.

The hypothesis that the undergraduate field is limited naturally raises the question, "Is the graduate field of education also limited?" The time allotted to this paper does not permit consideration of this question, but it may not be out of place to suggest that we should not assume that no limit can be prescribed for the offering of graduate courses in education.

IV. THE SELECTION OF HIGH-SCHOOL TEACHERS

F. B. Knight

This paper will discuss some of the problems around the selection of teachers, for high-school positions, who have never taught in high school, that is, the college graduate without experience. The group represented here is a large one, and, because of the present social structure, will continue to be a large one.

Let us consider several possibilities:

A superintendent interviews three candidates for a teaching position including history and English. Which one of the three candidates will he select? They are all blondes. They all have bobbed hair. They are all sorority girls. They are all Baptists. They have taken practically the same cultural courses. They have taken the same educational courses. The one difference is this: Miss X received a C in educational psychology at Wisconsin; Miss Y received a B in educational psychology at Illinois; Miss Z received a C at Chicago in educational psychology.

Now how much better or worse is a B at Illinois than a C at Wisconsin or Chicago?

Consider again: Miss X received an A in educational psychology at one college; Miss Y received an A in educational psychology at another college; Miss Z received an A in educational psychology at a third college.

Are the three A's equivalent? It seems that Miss X took educational psychology when a Sophomore; Miss Y took her work when a Junior; and Miss Z took her work in summer school "in order to get the state certificate."

Consider again:

Why should the superintendent look at the marks received in educational psychology at all? Has it ever been shown that degrees of success in passing undergraduate courses in educational psychology are associated in any significant way with degrees of success in teaching history and English?

It would seem useful, in thinking about teacher selection, to

distinguish sharply between aptitude in general and competence in specific subjects.

Can we not say: Our estimate of the general aptitude of Miss X for high-school teaching is such and such a score on a scale of 100. Our estimate of Miss X for teaching the specific subject, history, is such and such a score on a scale of 100. Under general aptitude could well be included for the high-school level such items as are suggested by the following titles of test parts of an actual professional test for elementary school teachers: "Professional Judgment"; "Theory and Practice of Teaching"; "Ability to Read with Understanding Professional Material"; "Social Information"; "School and Class Management." It is not claimed that these would be the correct titles for parts of a general aptitude test for beginning high-school teachers. But the *idea* is worthy of consideration.

Could we not advance the practice of teacher selection in the high-school field by substituting A's or B's in educational psychology at Wisconsin, Chicago, Illinois, and five hundred other teacher-training institutions with a score on a general aptitude test?

Could not a committee of teachers of educational psychology agree sufficiently upon the significant items in this field to construct a general test which would become one part of a general aptitude test?

Could not the teachers of high-school methods, through a proper committee, agree sufficiently upon the essential items to construct a test of universal use?

Could not all the attempts at teacher preparation be sufficiently organized so that all institutions could use the same final test and so all estimates of teacher preparation be reduced to objective scores? In this way a superintendent could estimate a teacher's aptitude in a fashion which is now a bit unlikely.

It is quite possible to make five forms of a test for elementary-school teachers, and it is quite possible to show that scores upon it do correlate with teacher success. I suggest that the same thing be considered in our field.

We now come to the matter of qualifications for the teaching of any particular school subject. Is there any reason why those re-

sponsible for teacher preparation for high-school French could not build a standardized French methods test, or why those preparing teachers of algebra could not build an algebra teachers' test, and so on? This would lead to appraising teachers for any particular subject on the same basis for all.

I suggest that superintendents would use our opinions more, and also our opinions relative to teacher candidates would be more worthy of use, if on a standard form in any part of the country a superintendent could get the same facts for all candidates. Perhaps as follows:

Miss X: Intelligence rating, 110; General aptitude rating, 214; Specific technique for French, 97; Specific technique for history, 154; Specific technique for algebra, 16; Specific technique for domestic science, 0.

The objections to this are many and perhaps determinative. Among the objections are:

Presumably equally competent college teachers of any subject could not agree on test items. Imagine Thorndike, Henmon, and Judd sitting down to settle the question of what beginning high-school teachers should know about educational psychology. The answer to this objection is that it might be tried.

A second objection is that we would need a new form each year and the expense would be prohibitive. I suspect that there are several foundations that could be persuaded to underwrite the cost.

A third objection is that the present situation is satisfactory. The answer is that the present situation is not satisfactory.

A fourth objection is that superintendents would not believe us if we did give them objective data. It is true that the so-called "practical" superintendent is a bit suspicious of us. It is hoped that we may regain his confidence.

A fifth objection is that there is not time to give college seniors four or five hours of testing. We could substitute these tests for final examinations in the education courses.

A sixth objection is that no one would want to take the responsibility for the construction of such tests. I think such men as Woody, Henmon, and McCall are but samples of twenty men who not only could, but would, see it through.

V. COLLEGE COURSES FOR ELEMENTARY-SCHOOL PRINCIPALS

James F. Hosic

As a means of learning what courses intended specifically for principals of elementary schools are at present offered in the colleges and universities of the United States, the following letter was addressed to each head of a department of education listed in the *Educational Directory* of the Bureau of Education for 1925:

To Head of Department of Education:

I have undertaken to make a report to the Society of College Teachers of Education in February on the present status of college courses for elementary-school principals. Please aid me by (1) Sending printed and typewritten material, including the regular and summer announcements of your department of education. (2) Writing a letter in which you explain your present policy in this matter and indicate change, if any, which you contemplate.

Since the time is short, please favor me with an early response.

With thanks for your co-operation, I am

Very truly yours,

JAMES F. HOSIC

One hundred and eighty-five responses were made to this letter. In most cases the correspondent sent both printed matter and an explanatory statement. The facts here set forth were gleaned from these two sources.

It appears that twenty-seven of the institutions from which replies were received offered courses in the summer session of 1925-26 specifically for persons whose chief interest was in the work of the elementary-school principal. Eighteen offered such courses in the summer session; fifteen scheduled such courses in the late afternoon or on Saturday morning, primarily for part-time students—teachers and principals in service—and six included such courses in their offerings for students in residence. Only one institution appears to have offered courses for all three types of students—summer session, part-time, and regular.

The courses in education in American colleges and universities are planned for the most part for prospective high-school teachers.

They include, on the one hand, general courses in the history of education, principles of education, and educational psychology, and on the other hand, courses in the teaching of various high-school subjects. The latter are commonly given by members of the departments concerned. For example, the course in the teaching of English is given by one of the professors of English.

The larger universities, however, almost universally provide instruction in administration and supervision, but this instruction is not generally differentiated as between students whose interest is in the superintendency and other students. This statement is much more universally true in regard to administration than in regard to supervision. In other words, prospective principals are invited to pursue general courses in administration rather than courses centering in their special work. Courses in supervision, however, tend to be general also. In fact, opinion is divided as to whether courses designed particularly for students with special interests are more profitable than more general courses.

Turning now to the question of what universities are giving courses for elementary school principals, we find that with few exceptions they are located in large cities. Of the twenty-seven referred to as giving courses specifically for principals, ten are state universities, two are municipal universities, and the remaining fifteen are, with a few exceptions, large, privately endowed universities. Clearly, supply and demand control in this situation as elsewhere. Most courses at present are for principals in service, and such courses can be given only in those institutions which are readily accessible to considerable numbers of principals. Only the largest schools of education, moreover, can afford a staff adequate to the manning of a large number of specialized courses.

Of what do the courses now given consist? The data are not now available for the formulation of an adequate answer to this question. Certain topics recur in the printed announcements of the schools of education, but there is no assurance that these topics cover the work done. They are not usually actual outlines of courses, but merely advertisements of the kind of thing the student may expect.

In general the courses given fall under two main heads: ad-

ministration and supervision. The first refers to the organization and management of the school; the second, to the oversight and direction of its classroom activities. Certain other duties of the principal sometimes receive attention, but are distinctly subordinated. These include the supervision of extra-classroom activities and the enlisting of the co-operation of the community. Generally some reference is made to the professional relations of the principal and to the methods by which his continued growth may be assured. Standards of efficiency in the office are only just beginning to be worked out.

The most elaborate printed statement of the topics to be covered in a series of courses for elementary school principals runs as follows:

Winter session: (*a*) The principalship as a profession; functions of the principal. (*b*) The principal as an organizer: selection, placement, and orientation of teachers, care of new teachers; classification, promotion, attendance, discipline, and health of pupils; schedules, platoon and other types of organization of the program; the assembly, library, playground, lunchroom, clubs, gardening, school bank and school paper; conditions favorable to good teaching. (*c*) The principal as an administrator: care of the plant; relations with janitor and other employees; office economy; reports and supplies; relations to superior officers.

Spring session: (*d*) The principal as a supervisor of teaching: nature and functions of supervision as contrasted with business management, present status and tendencies, relation to special supervisors; agencies of supervision; courses of study; judgment of teaching—necessity, technique, bases in principles of method, contrast with rating of teachers; technique of improvement of teaching—visitation and conferences, meetings and discussions, demonstration and observation, exhibits, reading and study, examinations and tests, evaluation of marking system, investigation and direction of study habits of pupils, reports to parents, lectures, reviews of current literature, professional library, co-operation with training schools and summer schools; attitude of supervisor and criteria of success. (*e*) The principal as a community leader: relation to parent-teachers' association, special days, evening meetings, publicity and support.

This course as a whole is called *The Work of the Elementary-School Principal*.

Another example is as follows:

Aim of course:

To present the various important problems that confront the administrator of a New York City school.

Content of course:

1. The material equipment of the school. Related problems of lighting, heating, ventilation and sanitation.

2. The organization of the school. (a) Principal and assistant: theory and methods of supervision. (b) Teacher: assignment, organization of work, method of evaluation of work. (c) Pupil: grading and classification according to characteristics and accomplishments. Scales of measurement. (d) Current problems.

3. The teaching process. (a) The curriculum; maximum and minimum courses of study. (b) Technique of study and instruction. (c) Evaluation of teaching and of abilities in terms of scales or standard tests.

4. The problem of control. (a) Problems of school administration, such as the accommodation of pupils, the grading of pupils, the distribution of pupils within the district, the adjustment of the course of study to meet local needs, types of school organization below the high school, and similar matters relating to the efficient and economical administration of elementary schools. (b) Problems of school supervision, such as the relation of district superintendent to the principal, the assistant, the teacher, and the parent; evaluation of work in terms of physical equipment, maintenance, management, course of study, instructional results; specific methods to insure standardization of effort and achievement.

These offerings are undoubtedly subject to modification in the light of investigation. No one yet knows as accurately as he needs to know just what duties principals actually perform, much less what duties they should perform. There are, moreover, principals and principals. Many principals teach all, or a large portion, of the time. Some supervise the teaching in relatively small schools of eight grades or of six grades. A few have charge of two or three schools. In Detroit certain principals act as district supervisors, having oversight of twelve or more schools. In small towns and in outlying districts of large towns one person frequently has charge of the work in both grades and high school. The majority of principals have no assistance. Some have clerks or assistants or both. Obviously there is no such thing as *the* elementary school principalship, but a function varying with varying situations. This fact must surely be taken into account in the laying out of college courses.

There is, besides, the distinction between theory and practice. The main facts as to the conditions and problems of the principal may be gathered, organized, and presented for mastery. Actual skill in management is much more elusive. It demands a certain

temperament and comes from particular types of experience. Precisely the same difficulty arises in this connection that appears in the training of teachers. Theory alone does not function. Tests of personal fitness for the office of principal will no doubt in time be devised. Systematic apprenticeship has already appeared. The plans of work in some of the universities tend to the distinctly practical. Coming so late as they do, there seems to be no reason why courses for principals should anywhere be merely academic.

Nor should they be narrow. One school of education catalogue declares that they should be "numerous and diverse." This catalogue outlines a sequence of courses intended for undergraduates and graduates totaling over 30 semester hours. These are all in the field of education as such. The question may fairly be raised as to whether persons in training for the principalship should not give more attention to background courses in subject matter than the scheme just referred to would seem to contemplate. A principal, in addition to being a person with thorough professional preparation, should be a person of genuine culture and broad sympathies. Courses in the technique of education should be arranged in such a way as to leave plenty of time for collegiate work of a distinctly cultural nature.

This aspect of the matter will be greatly influenced by state requirements for certification. A few states, notably California and Indiana, have recently enacted legislation by means of which the status of elementary-school principals is more precisely defined and certificates for the office are demanded. Already leading colleges in each of these states have announced that they offer courses to satisfy the new state requirements; hence it is perfectly clear that legislation will in all probability prove a powerful factor in determining both what courses shall be offered and what their general purpose and content shall be.

Turning first to the California regulations, we find that an elementary-school principal in that state must hold both a basic and a special certificate. These imply that the applicant must have satisfactorily completed a two-year normal-school course or its equivalent, plus 15 hours of work in general collegiate subjects, plus 15 semester hours of college work in school administration. The can-

didate must have had not less than seventeen months of successful teaching experience. Stated in other words, the requirements, in addition to experience in teaching, are that the candidate for a certificate of administration in elementary education must have had at least three years of schooling beyond the high school, a full year of which must be devoted to professional courses in education, half of these in administration.

What is meant by courses in administration will be clearer if a list of the titles of the courses recommended is examined. Ten hours must be taken in School Administration and Supervision, Growth and Development of the Child, Philosophy of Education, Educational Tests and Measurements, and History of Education in the United States. Five additional hours are to be selected from courses on the Work of the Elementary-School Principal, the Administration of a High School, or of a Junior High School, the Organization and Supervision of Elementary Education, the Organization and Administration of Vocational Education, the Supervision of Instruction, Statistical Methods, School Surveys, Rural Education, the Elementary-School Curriculum, the High-School Curriculum, State and County School Administration, City School Administration, Schoolhouse Hygiene and Construction, Methods in Mental Diagnosis. The basic elementary-school certificate is granted also to those who have the Bachelor's degree, providing their course included 18 semester hours of work in education. The elementary-school principal's certificate requires 15 additional hours in school administration.

The new certification law in Indiana provides for three grades of certificates for elementary school principals. The candidate must hold, or be qualified to hold, the highest grade of elementary-school teacher's certificate. This implies two years of work such as may be had in a normal school or school of education. Applicants for an elementary-school principal's license, first grade, must, in addition, be a graduate of a standard college or four-year normal school and have had three years of successful experience as principal, supervisor, or teacher within ten years preceding. In addition to these requirements, the applicant must have completed one year of graduate work in a standard university, specializing in elemen-

tary-school administration and supervision. Eighteen semester hours of specialization are required in the University of Indiana, and these must always include a course called The Administration of an Elementary School. The list of courses recommended is similar to that already given in connection with the California law. The reader notes, however, such additions as comparative education, school grounds, houses, and equipment, school budgets and accounting, and school records and reports.

The second-grade certificate in Indiana requires that the applicant shall be a college graduate and have taken 16 hours of work in administration, while the third-grade certificate calls for three years of college work, with 13 hours of administration. The chief differences between the different grades of certificates are in the amount of experience required and the amount of general collegiate preparation. The third grade at present qualifies the holder to be principal of any sort of elementary school in Indiana.

The rapid development of a movement to require special certificates of applicants for positions as elementary-school principals may safely be prophesied. Some of the large cities have required the Bachelor's degree or its equivalent, and the passing of a special examination on the principalship for several years. A growing literature of the subject is now in evidence. The national association of elementary-school principals has appointed a committee on qualifications and preparation for the principalship. At least one large city has established a single salary schedule for principals, and another appears about to do so.

All signs point to a rapid evolution of professional instruction and training in this field. Definite efforts should be made to build safely and strong the scientific foundations upon which the superstructure may rest.

VI. EXPERIMENTS LOOKING TOWARD FUNDAMENTAL CHANGES IN INSTRUCTIONAL METHODS IN PROFESSIONAL COURSES FOR TEACHERS

S. L. Pressey

Not long ago the speaker was told of a certain professor of education who spent an entire class hour in uninterrupted formal lecture on the importance of pupil participation and free discussion in the classroom. The saddest feature of the episode was that it is so typical of teacher-training courses. There are few places where one can obtain better examples of lack of transfer of training, and divorce of theory from practice, than in the average normal school.

The present paper reports, very briefly indeed, three attempts to avoid such inconsistencies and actually to apply certain of the newer ideas regarding educational method to procedures in teaching teachers.

Problem 1.—Cannot a large portion of the factual material in teacher-training courses be mastered outside of class, *by self-instructional methods*, with no burden upon the instructor, thus leaving the class period free for discussion—for real teaching, as distinct from lecture giving—and freeing the instructor for such work and for individual counseling with students?

The subject matter chosen for the experiment was statistics. Minimum essentials were determined by a careful count of the frequency with which different usages and terms appeared over a four-year period in five of the best-known educational journals, and also by study of methods required in use of the best-known standard tests. A series of practice exercises was then constructed, covering these minimum essentials. Each of the ten lessons had first a brief explanation and example of the topic dealt with, then several exercises on the topics, for the student to do. In the back of the booklet were answers to the questions in the exercises, charts showing how tabulations called for in the exercises should be done, and other helps.

In a course in educational psychology just one hour of class

time was spent on all this. The instructor made clear to the students that the materials they were to be asked to learn were actually of proved worth, as shown by research (a statement which cannot, unfortunately, be made, of much in our teacher-training curricula). He made a tabulation on the board to give them that much start. He then told them that they were to *teach themselves* statistics. They were to read over the explanations to each lesson and do as many of the exercises as they felt they needed to do in order to master the procedure covered; if they felt that they already knew the material they need not spend one minute on any of it. However, in two weeks there would be a diagnostic test covering this material. Those who made a perfect score would be through. Those who did not must go back to the lessons missed, and in ten days take another quiz. Everyone must, ultimately, *master* these minimum essentials.

And now the result of the method. Of a total of 147 students in the five sections 136 have passed the test with a 100 per cent score; in another two weeks we expect to have all, with the exception of the two or three impossibles, over this material. Not a "normal" distribution of marks! What the registrar's office will say we have not yet dared inquire. But there are nevertheless some merits to the method. That a student has taken this course means at least this one definite thing (and that a student has taken a teacher-training course so often means nothing that is definite): it is a guaranty that he at one time knew the minimum essentials of educational statistics. Note also that each student stayed with this material for only as long as he needed; if he already knew these procedures he need spend *no* time on this work. One of our graduate students recently had the clever idea that he would give a final examination in certain teacher-training courses in a number of institutions at the *beginning* of the course, and found that on the average over 15 per cent of the students passed the course before they had taken it. There was no such waste here. In short, there were all the advantages, in the way of definite objectives and standards and efficient learning, which go with the practice exercise method. There is surely much in teacher-training courses which might be handled in similar fashion. It is interesting to consider

whether some of our textbooks in our professional courses for teachers (many of these books seem arranged without reference to pedagogical principles) might not be organized on the practice exercise plan.

Problem 2.—Why not the Dalton plan in college? Really to do that was of course impossible, but what was done was this. The class was a large one, of seventy-one underclassmen, in elementary psychology, meeting five times a week. On Monday there was a meeting for the presentation of projects or contracts for the week. The remainder of the week was then spent in, roughly, the Dalton type of laboratory sessions, with the exception of an informal gathering Friday for exchange of ideas and discussion of questions. In other words, if any of you had visited this class during the middle three days of the week, you would have seen a situation reminding you distinctly of some of the best experimental schools of the country. You would have seen students moving about, talking to each other, experimenting, consulting this or that reference book. Over to one side was the instructor, available for help if needed, aiding this or that student in difficulty—never lecturing, rarely permitting herself to be used simply as a source of information, but always ready to guide and encourage and stimulate thinking about a problem.

And again, the results? In the first place, the students did learn to work a matter out for themselves, to run down an item of information, to do these things co-operatively, and discuss and defend their own points of view in the group. (And it should be mentioned in this connection that it was pitifully hard, at first, to bring these young men and women to a realization of their emancipation from the passivity and suppression of the usual college lecture.) Various checks, as by examinations given to this section *and* to a lecture section, anonymous reports from the students, indicated that the students were working as hard by this method, that they were covering almost as much ground, that they were better able to make applications and work out problems, that they liked this method much better, that it adapted much better to individual differences. Finally, the next quarter a count was made of the number of students going on to advanced courses in the department, from this

section and from lecture sections. Twenty-five per cent more students from this section than from lecture sections elected further work in the department.

It would seem that college students should be more responsible and more capable of profiting by these newer methods of instruction than elementary or high-school children. It would seem especially desirable that prospective teachers have such experience with such methods. But one point more. We have experimental schools in connection with our colleges of education. Why not experimental classes *in* a college of education? Must we not do this to be consistent, when we urge student participation and self-activity and the experimental point of view?

Now, briefly, the third and last problem. There is much talk nowadays about training to think. Well, why not job analyses of effective thinking?

From a total of 250 students the fifty averaging, for the two previous quarters, the highest in total grades and the fifty averaging lowest were selected for study. And by means of questionnaires, individual interviews, tests, and various other means an effort was made to find out how the good students were different, in their methods of attack upon their academic problems, from the poor students.

There is no time for details regarding the findings. The interesting thing is that (just as, for example, the bulk of the errors in English composition is made up of a few constantly recurring forms) there seem to be a comparatively few commonly recurring "key" difficulties in thinking and study. The question then is, Cannot training on these points greatly improve the efficiency of work? Trial of such training in the general classrooms has not gone far enough to permit measurement of its efficiency. However, there was also formed an "adjustment room" for probation students, especially for the purpose of training them to greater efficiency. I regret that there is no time to go into detail about this class. Diagnoses ranged all the way from thyroid insufficiency and a case of genuine sleeping sickness to too much fond mother. Most cases showed, of course, primarily the key difficulties mentioned above. But now the result. During the quarter when this course was given

a control group of probation students, not taking this course, failed three times as much work as those in the course. Whether the effect will be lasting we do not, as yet, know.

Now one more brief paragraph. We are constantly urging more professional training of teachers. But we do painfully little specifically to train college teachers of education for their particular work. Now graduate schools are extremely conservative institutions, and professional courses dealing with college teaching problems have not yet become strikingly common. But meanwhile it *is* possible to assign graduate students thesis topics dealing with teacher-training problems. This paper is in large part a report of such thesis work. One of our Doctor's theses this year is entitled "Some Applications of Modern Methods of Curriculum-Building to Construction of a Course in Educational Psychology." Another student is investigating certain personality problems presented by college students. Others are investigating college textbooks, applying child accounting methods to college enrolments, investigating college examination methods. Graduate students assisted in the adjustment room and the "Dalton" class. In other words, the effort is to train graduate students specifically as experts in teacher training, experts in higher education. This might be called a fourth experiment in instructional methods. Perhaps it is, in many respects, the most important.

VII. THE ACADEMIC MAJOR IN SCHOOLS OF EDUCATION COMPARED WITH THE MAJOR IN LIBERAL ARTS COLLEGES

W. C. Ruediger

An examination of fifty college catalogues, the data from forty of which are summarized in the accompanying table (Table I), makes it evident that specialization in what is commonly known as a major is today a well-nigh universal requirement for graduation from college in the United States. Among the fifty catalogues only three made no mention of a major, but even in these the major no doubt usually exists in fact. Electives are always guided by the dean, or other adviser, and most students prefer to concentrate in a field in which they are interested.

The fact that most students naturally tend to concentrate their work is exemplified by conditions as they existed at the University of Wisconsin in the nineties, or about thirty years ago. At that time a major, outside of certain course prescriptions, was not required by the catalogue, yet the upperclassmen, as far as I knew them, were concentrating in some major field of interest. We called it "specializing." Those of us who were preparing to teach were doing this for the purpose of specializing in our teaching, but other vocational interests, such as medicine and commerce, were also acting as forces for concentration.

The major in American college education is the logical outcome of the elective system, as this, in turn, was the outcome of the expansions of knowledge. When the elective system was first introduced it no doubt led to some chaos, but corrective forces soon presented themselves. Serious students have always had in mind a vocational or other objective that tended to concentrate their electives, and administrative officers were not slow in advising a certain amount of concentration. By the final decade or two of the nineteenth century the opportunity for specialization was well recognized and was bearing fruit. With the opening years of the twentieth century specialization began to be made a catalogue requirement.

In addition to the major, a first, and even a second, minor are sometimes required. A first minor is required in about 60 per cent of the colleges listed, and a second minor, in about 10 per cent. The amount of work required in the first minor averages about two-thirds of that required in the major, and that in the second minor averages about one-half.

The amount of work included in the major varies greatly. In seventeen out of the forty colleges listed the amount is set down on a sliding scale with a lower limit of 18 semester hours and an upper limit of 60 semester hours. Sixty semester hours, however, appears only once (Maryland), and then only when a choice is made from a group of related courses. The modal upper limit is 40 semester hours, or one-third of the college course. Taking the table as a whole, the indication is that the average size of the major is close to 30 semester hours, or one-fourth of the college course. In this figure even elementary courses may usually be included. But this does not always tell the whole story. There are sometimes found recommendations for collateral electives that greatly increase the amount of work. For example, one catalogue specifies only 20 semester hours of work as a major in Botany, but then goes on to say that the student should acquire a reading knowledge of French and German and choose among his electives chemistry, geology, physics and zoölogy. If the student could absolve none of these requirements by his high school work, he would have to take 72-84 semester hours of work in college in relation to his major alone.

When the college of arts and the college of education are a part of the same university the catalogue prescriptions for the major are alike, or substantially so, in about 50 per cent of the cases. In the remaining 50 per cent of the cases the variation is usually in the direction of less rigidity in the prescriptions on the part of the college of education. This may readily be explained. The college of arts faces a seemingly simple academic situation, while the college of education faces an obviously varied vocational situation. The prescription of majors and minors from an academic standpoint is easy because the matter is determined by relatively simple logical principles. The major in botany mentioned above exemplifies the point. For every one of the collateral subjects mentioned a

sound reason may be given, especially if the student is to become a college teacher of botany. But the situations that teachers who are passing through our colleges of education have to face are so varied that they can seldom be met by a hard-and-fast catalogue statement. As a result there appears to be a well-marked tendency in colleges of education to leave the matter in a relatively fluid state, trusting the dean or some other adviser to adjust the matter, within certain prescribed limits, according to the needs of each individual case. This occasionally gives rise to majors that do not look highly ideal on paper, but my administrative experience convinces me nevertheless that they are the best, both vocationally and educationally, for the students concerned. Teachers of nature study, of general science, of history and geography, and of arithmetic and introductory mathematics have their needs as well as specialists in botany, in history, and in mathematics.

The vocational advantage of a flexible major is obvious, but that something may be said for it also from the educational standpoint is not always recognized. That a satisfactory and satisfying education (usually) requires both breadth and depth may be granted at the outset, but what is depth for one is not necessarily depth for another. Minds and personalities differ. A person who feels an interest (a genuine scientific interest it may be too, I think) in many of the aspects of nature and feels a call to the teaching of nature study in the elementary school may get depth and breadth and inspiration out of every one of the introductory college courses in science. The synthesis that he needs is made, not by the courses as such, but by the student's own living interests and needs. This principle, I suspect, is basic throughout all secondary and higher education, but because it cannot be diagrammed on paper it is often lost sight of, especially by college teachers. Our present epidemic of "orientation" and "art of living" courses is a result of this oversight. It is greatly to be doubted that there is one integrating course for all; neither are all persons born again, intellectually, by exhausting one narrow field of endeavor. My experience in conferring with students has convinced me again and again that a selection of studies that looks thoroughly disorganized on paper may nevertheless have brought about a most illuminating

unity in the mind of the student. The subject that precipitates a mental reconstruction more often than any other, apparently, is metaphysics, or the problems of philosophy, but others find their principle of integration in quite different, and often unexpected, directions.

The way in which colleges of education are recognizing the actual needs of students is best exemplified by a few excerpts from catalogues. In the catalogue of the University of Pittsburgh, dated October 1, 1924, page 189, we find the following:

It is very important that prospective high-school teachers select a combination of subjects that is in demand. . . . Experience has shown that the three most useful combinations are English and History; Mathematics and Science; Latin and modern languages. . . . Students specializing in History should distribute their work over the field of the social studies rather than devote the major portion of their time to any one period of History or to the study of History exclusively. Students specializing in science should distribute their work over the field of science because a teacher of science is frequently required to teach all the high school sciences. Public speaking is desirable as a part of the preparation for teaching English. Students preparing for the teaching of high school English should not neglect English composition in making their selections of English courses.

The catalogue next goes on to give helpful advice to students who wish to teach in elementary schools, especially of the platoon type. With the coming of this newer type of elementary-school organization even our university colleges of education will have to give respectful consideration to the needs of the teachers in these schools. Their needs are just as dignified as the needs of high-school teachers or even of college teachers.

The 1924-25 catalogue of the College of Education, Ohio State University, page 26, contains the following:

There are some instances in which closely related subjects may be combined for a major or minor. Combinations regularly permitted are given below. In all cases where combinations are made, fifty (quarter) hours must be offered as major, thirty hours as a minor. At least ten hours must be taken in any subject presented as a part of a major.

1. American and European History and not to exceed ten hours of Political Science or Sociology or Economics or Economics and Social Geography.
2. Botany and Zoölogy and Physiology. (All three permitted for Major, but not more than two for Minor.)

TABLE I

ACADEMIC MAJORS AND MINORS IN COLLEGES OF ARTS AND COLLEGES OF EDUCATION
(UNITS GIVEN IN SEMESTER HOURS)

School	College	Major*	First Minor	Second Minor	Year Chosen	Guide
Arizona	Arts	24-40	12			Dept.
Arizona	Educ.	24-40	15-20			Dept.
Arkansas	Arts	30	18	12		Dept.
Arkansas	Educ.	30	18	12		Dept.
Bucknell	Arts	24	12	12	Jr.	Dept.
Bucknell	Educ.	24			Jr.	Dept.
Cincinnati	Arts	18	12		Jr.	Dept.
Cincinnati	Educ.	Required				
Chicago	Arts	30	20		Jr.	Dean
Chicago	Educ.	30+	20		Jr.	Dean
Colgate	Arts	18s+Fr.	9s		Jr.	Dean & Dept.
Connecticut College	Arts	30				Adviser
Cornell College (Ia.)	Arts	18-24				Adviser
Florida University	Arts	18+Fr.				Dept.
Florida University	Educ.	Urged				Dean
George Washington	Art	24+			Jr.	Dept.
George Washington	Educ.	24+			Jr.	Dept.
Goucher	Arts	30 Adv.			Soph.	Dept.
Illinois	Arts	20+Fr.	20			
Illinois	Educ.	20				
Iowa	Arts	24-40 All				Dept.
Iowa	Educ.	24-40 All				Dept.
Lawrence (Wis.)	Arts	24 Adv.	24 permitted		Jr.	Dept.
Maryland	Arts	20-40 Dept. 30-60 Group	20-30			
Maryland	Educ.	Required	Required			
Michigan	Arts	25	15			Adviser
Michigan	Educ.	25	15			Dean & Adv.
Missouri	Arts	24	18			Dean & Dept.
Missouri	Educ.	None	None			Adviser
Montana	Arts	27-36				
Montana	Educ.	27-36	17			
S. Newcombe	Arts	18 Adv.	12 Adv.			
N. Carolina	Arts	20-33	Required	Req'd	Jr.	Dept. & Dean
N. Carolina	Educ.	27(?)	13(?)		Jr.	
Oberlin	Arts	18-36 All			Jr.	Dept.
Ohio State	Arts	27-40			Jr.	Dept.
Ohio State	Educ.	30-33	17-20		Jr.	Dept.
Ohio University	Arts	36+Fr.	18			Dept.
Ohio University	Educ.	24-36	15			Dept.
Oklahoma	Arts	20 Adv.	12 Adv.		Soph.	Dept. & Dean
Oklahoma	Educ.	34 (Educ.)	16	16		Dean
Pennsylvania	Arts	18			Jr.	
Pennsylvania	Educ.	18-40				
Pittsburgh	Arts	24-40	12		Soph.	Dept.
Pittsburgh	Educ.	24-40	12		Soph.	Dept.
Randolph Macon	Arts	18				
R. M. Woman's College	Arts	18	18		Jr.	Dept.
Rochester	Arts	12 Adv.	6 Adv.		Jr.	
Rochester	Educ.	None				
Smith	Arts	24-30			Jr.	
Southern Calif.	Arts	24-30	12		Jr.	Dept.
Southern Calif.	Educ.	24-30	12		Jr.	Dept.
Stanford	Arts	Up to 40			Jr.	Dept.
Stanford	Educ.	Required	Required		Jr.	Dept.
Swarthmore	Arts	18-36 All			Soph.	Dept.
Texas	Arts	24-30	12-18			Catalogue
Texas	Educ.	Up to 36	Up to 24			Dept.
Vanderbilt	Arts	18 Adv.	12 Adv.		Jr.	Dept. & Dean
Vassar	Arts	36				Dept.
Virginia	Arts	24				
Virginia	Educ.	18+				
Wisconsin	Arts	24-40			Jr.	Dept.
Wisconsin	Educ.	20-40			Jr.	Dept.
Wyoming	Arts	26-50	15	15	Jr.	Committee
Wyoming	Educ.	26-50	15	15	Jr.	Committee
Yale	Arts	24-36				

* s = restricted to one subject (a selection of related courses is frequently allowed).

+ = plus elementary courses.

+Fr. = plus Freshman courses.

Adv. = advanced courses.

All = elementary courses included.

3. Geology and Economic and Social Geography for Major or Minor in Geography.
4. Industrial Education (various courses).
5. Physics and Chemistry.
6. Physics and Mathematics.
7. Sociology and Economics.

Continuing, this catalogue says:

Professional subjects may be chosen as minors but not as majors except in the case of Psychology, which may be used as a major by those preparing for psychological positions in the public schools.

This statement is in accordance with the principle that the major should embrace the content of one's chosen field of work, not the professional guide. While not often stated, this principle appears nevertheless to be very generally followed in our colleges of education. A striking exception is found in the catalogue of the University of Oklahoma (May 1, 1925, p. 102). This catalogue prescribes 34 semester hours in education for the Junior and Senior years, and says:

Education is the student's major subject in the School of Education. The student must complete 16 (semester) hours in each of two subjects which he expects to teach. These are known as teaching minors.

That education usually does not make a logical major for the undergraduate student is no doubt true, but that it sometimes does is also true. A school ministering to teachers in service at least occasionally finds among its undergraduate students experienced teachers who are either already in administrative or supervisory positions or who are definitely preparing for such positions. For such students education makes a logical major in the generally accepted sense of that term.¹

¹ For an excellent study of *The Subject Combinations in High-School Teachers' Programs*, the reader is referred to the University of Iowa Extension Bulletin No. 136 (November 15, 1925).

RESEARCH IN EDUCATION

I. NEEDED RESEARCH IN ELEMENTARY EDUCATION

Charles H. Judd

In the last few years the number of scientific studies in the field of arithmetic has fallen off as contrasted with earlier years. The number of scientific studies of reading, on the other hand, has steadily increased. Yet arithmetic and reading are both major requirements in the elementary curriculum. Not only so, but if either one is urgently in need of study it is arithmetic, for in this subject there are more failures after the second grade than in any other subject of elementary instruction.

If we inquire why it is that arithmetic is going forward less rapidly than reading I think we shall uncover certain fundamental principles regarding research which it is highly important for us to consider. Arithmetic is comparatively static in its content and methods in spite of recent heroic efforts to modify it. The only change which has been made in arithmetic in recent years that is significant is a reduction of its content. Even this reduction has been very slight. Not only is arithmetic static as a body of instructional material, but the scientific studies which attempt to deal with it are equally static in their methods. We have had tests and more tests since Rice made his first tests and reported the results in 1901. The tests have told us where arithmetic fails and where more effective teaching should attack the subject, but the methods of new attack and the methods of further study have until very recently been held back by the universal devotion to tests.

With reading the situation is very different. A new procedure has appeared in the schools in the field of reading. This is the procedure of instruction in silent reading. No revolution of greater importance has come in elementary education since the time of Horace Mann than the introduction of the concept of silent reading. This new method of teaching has been a subject of vigorous scientific study. Indeed, it may be said that the discovery of silent

reading and its introduction into schools are results of scientific investigation. The investigations in this field have also been of a novel and objective type. They have employed the methods of analysis. They have employed an elaborate technique quite inaccessible to the amateur. Reading is a moving subject. Arithmetic is static.

The work which has been done in arithmetic in recent years is for the most part routine work. One investigator after another has done, with very slight modification, just what his predecessor did. There is no field in which industry and faithful imitation have been more conscientiously cultivated than in the scientific studies of arithmetic—unless it be perhaps in that much-trodden territory of spelling.

The lesson which these illustrations ought to teach is the lesson that industry will not serve as a substitute for real research. I do not want to be misinterpreted. There certainly is a place in education for routine. I believe in tests as means of finding out where a pupil stands in his work. I believe in tests as valuable devices for the inspection and direction of school work by administrative officers. I believe in industry. The point I make is that routine and industry must not be accepted as satisfying the demand for research.

Let me take another phase of modern education as a means of illustrating my point. We are in the midst of a most important movement for the reconstruction of the whole school system. The elementary school is losing its seventh and eighth grades. This readjustment at the upper end of the elementary school is quite certain to be followed by a vigorous reconstruction of the first six grades. When one asks what are the forces which have brought about this revolution, one gets vague answers. One learns that social pressure has produced the change; one learns that the lengthened school year, better equipment of teachers, and other like causes have operated. The interesting point is that our technical journals which discuss scientific problems are almost destitute of papers bearing on this upheaval. One finds, by reading the technical journals, that research follows in the trail of that which has been done. We have a few studies on the superior retention of the

reconstructed school. We have some studies on the degree of success achieved in teaching algebra in what used to be the grades. One feels, however, that science is not the leader in the movement of reorganization. Science is merely the bookkeeper recording transactions which others have initiated and executed.

What I have been saying is that a great deal of our so-called "educational research" is so limited by existing conditions which are only vaguely understood, and our scientific investigations are so routine in their methods that they serve very little to carry education forward.

I attribute the situation to the fact that we have very little energy to devote to true research. I am impressed by the fact that our best people in education are for the most part taken away from research by urgent practical duties. I find my colleagues in our own and other institutions occupied in making people listen to accounts of their discoveries. Most research people literally have to go out and compel teachers and superintendents to pay attention to the most recent findings of educational science. I had a letter not long ago from one of the leading superintendents of the country asking for a man for his research division. "I want a man," he said, "who can go before the teachers and show them how to use the tests and other modern devices."

In one field in particular I am impressed with the difficulty of getting research carried on. That is in the field of school administration. In this field I find some dogmatic statements and I find a great deal of very useful practical activity, but little true research. The young men of marked ability who ought to be studying the functions of school boards are out in the field trying to deal with them. The men of intellectual caliber sufficient to enable them to invent tests by which to evaluate the work of principals and superintendents are applying ready-made tests on pupils. There is less research going on today in the field of school administration than there is in the field of industrial management and administration. The reason for this is that industry is convinced that it pays to organize itself as highly as the best brains procurable can organize it.

What I have been saying about educational research is said not at all because I am pessimistic about its possibilities. I confess I

am impatient with its slow progress and with the apparent lack of equipment in men and time for fundamental work. Having said this, it becomes my task to try to suggest ways and means and also kinds of research which I believe we should develop.

My first comment by way of suggesting plans for expansion deals with the means necessary. I feel sure that we must draft larger energy for the task than we now command. A few people scattered here and there in teacher-training institutions, working in isolation with a margin of time taken from their duties as teachers and from the enticing business of preparing salable books, will not serve to collect the information necessary to guide American schools. We need to learn how to reinforce greatly our ranks and how to pool our energies, as the men in natural science have done through their National Research Council. We need to overcome the chief blight which has operated to impede educational research, namely, institutional jealousy and the desire in some quarters to turn research into institutional advertising. We need to make school people and boards of education understand that research is as vital to the life of the schools as it is to the development of industry. We need to quadruple the energy that is now available for research.

Having done this—indeed, even before we accomplish it—it is our duty, through conference of the best minds in our field, to decide what is most fundamental. There is a possibility of directing research. The ambitious individual who is thinking first, as he naturally does, of his own career, is not likely to start on the investigation of fundamentals. The attractive problems under present conditions are the superficial problems. One can get money for a survey, one can get glory by attaching his name to another test. These are the minor and relatively unproductive jobs from the point of view of science. They are perhaps worthy enough in their way, but they become exasperating, petty obstacles in the pathway of educational science.

It is in a spirit of advocacy of a broad co-operative program that I offer suggestions regarding what I believe to be fundamental problems.

The first large investigation which we have to make is an inves-

tigation into the typical characteristics of pupils of different ages. It is perfectly clear that the school has as its major problem the promotion of the development of pupils. As Meumann pointed out years ago, we have many a brave start in describing mental development, we have much scientific study of infants, and then the problem becomes too complex for us. We have nothing regarding the total development of pupils corresponding to what the physicians call the "natural history of a disease"; that is, we do not know how the learning processes with which we are dealing progress stage by stage from inception to consummation. Take, for example, arithmetic. McLellan and Dewey told us thirty years ago where arithmetic begins, but no one has told us in any systematic fashion the next and the subsequent stages. I think myself that McLellan and Dewey were wrong, but at least they attacked a fundamental question, and their work ought to have been followed before this by a fundamental inquiry into the whole problem of the nature of number ideas and their development.

There is continuous natural history of number consciousness; there is a continuous natural history of reading and of drawing and singing and play. Until we know these continuous histories we cannot organize the subjects.

Lest my program should be misunderstood, I hasten to point out that I am not ignorant of the charts which have been made out in the different subjects showing the so-called "grade standards" in these subjects. I regard these grade standards as in a very large measure products of the present school program, in many cases highly unnatural products. I do not ask for more grade standards. I ask rather for fundamental inquiry into the nature of pupils' efforts in the primary grades and in the fifth grade, and such a comparison of the various kinds of activities as shall tell us something about the degree of docility and the degree of fixity of the pupil's intellectual processes, something of the difference in general intellectual grasp and interest which distinguish fourth-grade pupils from sixth-grade pupils. I conceive of this problem as one describing the general intellectual setting into which arithmetic or any other study comes in the fourth grade. The problem is not one of measuring arithmetic as it is in that grade, but of understanding

through analysis the way in which it fits or does not fit into the pupil's mode of thought. Is arithmetic too abstract for the fourth grade? Is it too systematic to be really understood, and therefore likely to be merely learned by heart? Is it natural to a pupil's interests? What are the pupil's interests at this stage?

The second fundamental as it seems to me is a study of the social institutions to which we introduce pupils in the schools. I believe there is a rich and comparatively unworked field in the history and analytical study of social institutions. What is number in the perfected form which appears in the Arabic numerals? What is the essential advance of the Arabic numerals over the Roman system? How did the race come to make the advance which it did? Or, turning to drawing, let us ask, first, Why does society have the particular kind of esteem for drawing that it does? What is the relation of drawing to society and to the individual which makes it so much less important in the school program than arithmetic? When we are through analyzing the social character of arithmetic and drawing and the other subjects in the elementary curriculum, we shall be prepared to ask about the school as a social institution. What is its place in the life of our generation? Let it be noted that I am advocating investigations. There have appeared from time to time those who had theories about the value of arithmetic and reading and spelling as social instruments, and we have often listened to philosophies about the nature of the school. My suggestion is that the time has come to investigate these problems by empirical methods.

You will observe that I am trying to get at the fundamentals, not merely to deal with current practices. I am not so much interested in stimulating inquiries into the present status of the school and its present practices as I am in stimulating a series of inquiries which shall go back of the school and acquaint us with the human nature and the social demands out of which the present school has grown.

I am quite certain that after we have made such fundamental studies we shall introduce into the schools forms of instruction which are not now there. The grade standards which are now available are measures of what is. If we go forward in our science

merely measuring what now is, shall we ever be leaders in introducing new materials? Already the more progressive practical school people have outrun our tests. They are clamoring for a new curriculum, and too often the best we have to offer them is the average of present practice. The time has come when averages will not satisfy. We must study fundamentals.

I am sometimes afraid that the failure of educational research to cope with its fundamental problems will result in more superficial studies. I see what seems to me to be a marked tendency toward superficiality in the studies now being made of the curriculum. I find in many quarters satisfaction in the fact that the curriculum is to be revised by cutting out all that practical members of the community do not actually use. When I ask what is meant by the terms "actually use," I get an answer which seems to me very far from fundamental. Shall we teach only those combinations in arithmetic which we find people using in the stores in their private lives, or shall we recognize that the use of number has transformed modern life? The very idea of precision is a new idea, and every modern man and woman uses that idea, even when he is not adding 7 and 3. I insist that what we need is fundamental research into the history and nature of such social institutions as numbers, language, exchange, and industry.

The study of the way in which minds mature and the study of the way in which society reacts on the individual must be accompanied by a study of educational pathology. I feel sure that we tolerate in schools a great many unsanitary intellectual conditions. We do not recognize them any more than the medievals recognized the unsanitary conditions of their cities. It requires science to find what is wholesome and what is not wholesome. Tradition will not tell us. I have in mind such a fact as the formal order of the school. A generation ago order was one of the chief concerns of the teacher. Our generation thinks of order of the old-fashioned type as pathological, unnatural, undesirable and unfavorable to intellectual progress. Where did the formal order of the last generation come from? Why did that sort of disease seat itself in the school? How was it removed? In like fashion, I believe we can find clear evidences of pathology in our present educational system in the fact

that many people do not read after they leave school. Why is this so? If the work of the school is successful, there ought to be a wholesome attitude toward the school achievements. That there is a falling off in the use of reading when pupils leave schools is a symptom of unsanitary intellectual conditions.

Again I pause to say that what I am advocating is not a study of the details of present practice. What I am asking for is a fundamental examination of practice in its entirety, including its consequences. Schools have measured children. Let them now measure themselves.

One of the greatest difficulties which must be faced by the advocates of a program of the kind which I have been recommending is that we have no methods conveniently at hand for making some of these investigations. There are methods which the last quarter of a century has perfected for measuring present products. Some of these methods are so readily usable that anyone can employ them. Their very perfection leads them to overuse. The result of their existence is that one is less likely to think of strange problems for which there are no known methods of investigation. One is overwhelmed by the conventional methods because they are so easily accessible. There is another fact about current investigations; they tend to follow the lines where the least expenditure of energy will lead to the most spectacular results. It is easily possible, in our departments of education, to get certain easy statistical pieces of work done. On the other hand, students are loath to embark on the arduous tasks which involve laboratory work of a careful minute type, employing an elaborate technique.

If we propose the problem of finding out what are the mental characteristics of fourth-grade boys, the easy answer is that which comes from a tabulation of average grade scores for the fourth grade. Everybody knows that these average scores do not answer the question. There is a physical, mental, and moral maturity in the fourth grade which is as little described by average scores as the chemical processes of combination are described by measuring the ashes and smoke produced. The fourth grade has general characteristics which mark it as the period of emergency from the primary grades. The fourth grade is a period of voluntary assump-

tion of a new attitude toward the world of people and things. If we do not have methods of discovering and recording these facts and using them to determine school procedure, then the sooner we set ourselves to the task of evolving the needed methods, the sooner our science will emerge from the embryonic stage in which it finds itself.

I have not enumerated all of the fields in which productive fundamental investigation is needed. I may run rapidly over some of the rest. We have had studies of finance, and they have all shown that somebody must make a careful study of the taxing system. We may wait until the economists have made fundamental studies of taxation or we may take our share in the examination of our own institution in its relation to public support.

In matters of personnel management, management of teachers, and management of pupils, we find that school people are either superficial or full of quotations of pronouncements made by students of industrial organization. Shall we wait for someone to deal with the fundamentals of social supervision outside the school and then try to carry over their results, or shall we study the fundamental principles of human relations in the institution which is supposed to mold these relations?

In the matter of the preparation of textbooks and other mechanical aids to instruction we have been peculiarly inert. We leave it to interested commercial concerns to invent and perfect educational toys and to prepare and print our books. We are dominated socially and pedagogically by forces which privately scoff at most of our scientific endeavors. Why not make a scientific investigation of the relation of the school as a social institution to the industrial forces which influence its operation?

Another line of inquiry has to do with the operations of the classroom. Some of the most influential investigations made in recent years have had to do with the problems of classroom procedure, and yet anyone who contrasts the facts which appear during observation of a good teacher and the recommendations made in even our best textbooks on methods knows that the scientific description of teaching is in its infancy.

I close this sketch of fundamental studies which are waiting

to be taken up by students of the elementary school with the comment which reiterates what I said at the beginning. Our science is on the threshold of great expansions in scope and influence. The present school is to be reconstructed. The process of reconstruction will be a slow process of trial and error if our science lags. It can be made into a process of rapid, economical evolution guided by fundamental principles if we can secure the energy to devote to research and can release this energy from absorption in mere re-cavassing of current practices by methods which have become conventional because they are readily used by novices.

II. NEEDED RESEARCH IN SECONDARY EDUCATION

Thomas H. Briggs

In secondary education the primary need is for an acceptable philosophy, rather than for research. Philosophies we have in plenty, but conditions that have changed rapidly during the past few years—conditions economic, industrial, political, and social outside the schools, and conditions of teachers and pupils within—demand a philosophy that is comprehensive, complete, consistent, convincing, and generally accepted. Only this will give meaning and a reasonable justification to research; only this will supply the stimulus that will lead to the wisdom, technical skill, assiduity, and application necessary for research to come into its own. Research will give the facts on which this new philosophy is built; and when it is proposed, research will furnish the facts leading to its establishment.

By way of illustration we may cite two questions that all would like to have answered: (1) Who should be admitted to secondary schools? and (2) What is the relative effectiveness of old- and of new-type courses in mathematics? Intelligently to consider the first we must know the characteristics of the adolescent population, especially of that fraction which is seeking to continue its education beyond the elementary stages; we should know and consider the educational practices and results of other civilized peoples; we must know what the possibilities are in the secondary schools that we have or may reasonably expect to obtain; we must contemplate the alternatives offered by work or idleness; and so on. All of these facts research can furnish. But no answer to the question can be satisfactory—no rational answer, indeed, is possible—unless we refer all facts to a philosophy to which general approval has been given by the public at large. Similarly for the second question. The effectiveness of mathematics courses, old or new, must be measured by the objectives that are based on a reasonable philosophy of education. The chief reason why there has been more research in elementary than in secondary education is that the former is far less

complex than the latter; its objectives are more generally understood and approved; its results can be more satisfactorily measured.

Research may be defined narrowly or broadly. Its essence is careful first-hand inquiry directed to the discovery of facts. Freed of prejudices, it uses suitable techniques to ascertain the truth. But more than this is involved. Research is valuable in proportion as it results from a wide knowledge of related practices in education, a vision growing out of an accepted philosophy, and as it is followed by interpretation that leads to application and change in a program of practice. The field of research in education is not yet so exhausted as to necessitate mere counting or the intensive cultivation of one small area dissociated from the larger plat.

Research in education is a lusty youth. In a few brief but crowded years it has been born, developed, and secured for itself a respect greater than its practices can in every case warrant. Among schoolmen there is a demand for "scientific authority"; and results that are based on figures and footnotes, technique and tables, are with great frequency uncritically accepted. Even competent research workers have been known to give their approval to studies that are fallacious in conception, execution, and interpretation. This unfortunate state of affairs is due largely to the fact that research in education is in a formative stage. Its workers have not yet learned to pass judgment only in the field where they themselves are expert and to be impersonally and fearlessly critical. One thing that research in education needs is more conscientious and thorough critical review of publications. Our reviews are less often soundly critical than superficial and courteous.

Educational research is so young that almost everyone in this society can readily recall the intellectual shock, gratification, and exhilaration that he had when he first realized that problems can and should be solved by methods other than what I like to call "impressionistic." No longer were we to decide on programs by pooling impressions, which were loosely called judgments, or by giving undue deference to the biased opinions of others, especially of those who knew education only from dim and warped memories of old and often unique class practices. The change has been gratifyingly

great—quite as great, I suppose, as we could hope for; and it is still going on, evidenced in many and unexpected places. But “impressions” and personal influences are still too potent. They will yield in proportion as research workers can show simply and clearly the facts that necessitate change and that support new proposals.

Among school people research has become almost a shibboleth. There remain a few recalcitrant rejectors, chiefly those to whom any change is abhorrent and those who have good reason to fear that facts will affect the prestige of the practice or subject which they by long habit have come to worship. On the whole, however, respect for research has risen to such an extent that everybody is attempting it. Wherever one goes he hears that “we are experimenting” on this or that—experimenting too often without clearly defining the problem, without a sound technique, and with no measured result. “The voice is Jacob’s voice, but the hands are the hands of Esau.” The challenge to research workers is threefold: first, to retain the respect and enthusiasm of the untrained by sound work, especially that which is practically applicable; second, to popularize results of studies, publishing in such manner that any intelligent reader can to some extent appreciate the technique used and the conclusions reached; and third, to utilize the present hospitality to secure opportunities for experimentation under the normal conditions of the classroom.

In our enthusiasm over the possibilities of research in education we have perhaps attempted to make scientific workers of too many people who are unfitted by nature, temperament, and general education; we have certified as competent too many who are not and never can be. Almost any intelligent and industrious graduate student can, under the guidance of an inventive, analytic, generous, patient, and charitable director, produce one respectably scientific study. He is not a research worker if he stops at that. “Professor,” said a student as he handed in his dissertation, “people will think that you are responsible for all the scientific work in this.” “If you don’t produce anything else,” responded the professor, “they will know I am.” I do not mean to be too critical here, for there are many extenuating circumstances; I am merely preparing to say that another important obligation of the research worker is to train

teachers, administrators, and even laymen who can never do research work themselves to appreciate as well as respect the scientific method and its results.

From forty-odd respondents I have received more topics for research in secondary education than have been attempted altogether anywhere up to this time. Indeed, an analysis of any major problem, such as that of the curriculum, or of method, or of social control, will furnish enough detailed topics to keep busy all the graduate students of any university for years to come. Why have we had so little research in the field? First of all because research in education is so young and competent research workers are so few. The competent who have a reasonable amount of time which they may devote to research are fewer still. Primarily they are all employed as teachers. They carry as heavy a teaching load as other professors, and their very competence usually involves them in other undertakings that are imminent or that are imposed on them by appreciative administrators. Research may not be more time-consuming than any other important work, but even the simplest problem properly attacked requires not only an astonishing amount of time, but also continuity and nerve-racking persistence. The results sometimes do not seem to repay for the expenditure—indeed, they may not. But, as in other fields, we may be perfectly sure that the most important discoveries will never come unless the research worker is not only permitted, but also encouraged, to develop his technique by such investigations as challenge his interest. One result may pay for years and years of apparent waste.

As one reflects on the problems in secondary education (later to be illustrated) that need solution he is irresistibly forced to the conclusion that for the sake of economy and effectiveness of practice there must be a great—in comparison with present practice, an incredibly great—increase in the amount of research. Millions of dollars are wasted annually and thousands of young people are made less effective certainly than they could be largely because research has not given us the facts that would warrant and necessitate changes. If support for this needed research is to be secured, it is incumbent on scientific workers:

1. To choose wisely subjects for research. Even in the train-

ing of students it is possible to lay emphasis on desired practical outcomes. Certainly when a man is expert in research his time is too valuable to be spent on projects that do not promise some material contribution to the improvement of practice. There is an economy, if the broad requirements of teaching permit, for a research man to attack, one after another, topics that contribute to some one inclusive major problem.

2. To develop research by sound technique. There are today so many good techniques, all of them clearly presented in manuals and in reports, that there is little excuse for poor work. Only a few men are competent to develop new techniques, and this their genius will compel them to do. The great majority of research workers in the field of education can make their greatest contribution by appropriately applying over and over again the methods that are already proved sound. There is still a plentiful opportunity here.

3. To report their studies clearly. In the past few years there has been a marked improvement, as anyone may see by examining the files of magazines, in the manner of reporting research studies. The problems are more clearly stated, the proposed procedure outlined, the data presented, the results set forth, and the whole summarized. Yet there is more to do. Clearness is imperative, and it is not too much, as we may learn from reports in other fields, to expect a certain amount of attractiveness in reports. A frank criticism, a statement of unsolved problems, and implications of the results would add value to publication.

4. To popularize results. It may be too much to expect all research workers to do this, but there is a crying need for it to be done by somebody. A considerable number of reports of importance to practice have had little or no effect on school procedures. This is due partly to the fact that the reports are not widely known; partly because we have not trained administrators and teachers to be alert to a kind of research for which they are quite competent, experimentation in administration and in classroom procedures, and partly because few take the initiative to stimulate school people to overcome the inertia of traditional practice.

What Professor Francis D. Curtis, of the University of Michigan, says of curriculum studies is applicable to other fields as well. He writes:

The curricular researches in secondary science to date have been fragmentary and narrow. Somebody makes a little investigation of magazine science, or children's interests, or what not, and nothing further is done about the findings other than to publish them. None of this material is used in any way in the building of saner or better curricula or syllabi; authors continue to follow the same old lines with little or no deviation except that dictated by their own personal biases. The need is, therefore, for somebody to undertake to carry on or direct a series of synthetic researches, attempting to analyze out whatever elements of basic value in the making of curricula may be in each of the studies thus far made—all of them, and to devise a means of evaluating and weighting each of these basic curricular elements in building up better curricula than we now have. There ought to be *some* light upon this problem hidden in every research inquiring into materials which people actually use or are interested in; the present need is to find somebody willing to undertake and see through the colossal task involved in the attempt to clarify and select objectively the elements in every branch of secondary science—and no doubt the same thing is true of all the branches of secondary education.

Some years ago Professor Pittenger summarized in one of the popular educational magazines what investigators had found regarding marks and marking systems; later Rugg performed a similar service for transfer studies; and recently there have been several summarizing bulletins from the University of Illinois and other sources. We need more of this. However, as Professor Monroe writes, "Uncritical studies may not be very valuable. In fact I have sometimes thought that a summary without any attempt at evaluation might do more harm than good."

Pertinent to the popularizing of results, perhaps at this time necessary to it, is a suggestion from Professor Walter S. Monroe:

In my judgment there is urgent need for a type of critical study in the field of secondary education which is not included in the popular concept of educational research, or at least its inclusion is not explicit. The types of studies which I have in mind are deduction rather than induction. For example, a great deal of so-called "research" has related to supervised study, but a critical examination of the published reports reveals practically nothing concerning the actual procedures that a teacher should employ in directing learning outside of the recitation period. These procedures will not be discovered directly by collecting and tabulating quantitative data. They must be deduced from the laws of learning and the principles of teaching. It is perhaps true that as yet our formulations of these laws and principles are not sufficiently complete so that the deductions will have a high degree of dependability, but tentative deductions are at least possible. After the procedures which a teacher should employ have been deduced there will of course be need for verification, which in some cases should be experimental.

Another task that research workers should undertake is the repetition, under exactly the same or under similar conditions, of reported studies. We are far less inclined in education than are workers in other of the older sciences to be critical of what is published, to subject the technique and the reported results to the test of repetition. Many studies are widely cited that have obvious imperfections. Thorndike and Woodworth in their epoch-making experiments on transfer had no check-group of subjects, yet the experiments have never been repeated with this desired detail. Dearborn, by repeating the experiments on transfer by Ebert and Meumann, revealed a fallacy not widely suspected. And Holley, by applying in Illinois Van Denburg's technique, showed that the latter's conclusions were not true in a different environment. Professor W. F. Dyde, of the University of Colorado, writes:

In all our experimental studies the report of the experiment should always be made with the idea that it can be exactly duplicated. For instance, where two methods of teaching are under comparison it would be considered obligatory upon the investigator to publish a sufficient stenographic sampling of the opposed methods of teaching so that other students could see precisely the nature of the experimental factor.

To *prove* originally meant to *test*, as in "The exception proves the rule." We need to know to what extent experiments in education will stand the trial of repetition.

To ascertain what research workers think are problems in secondary education that should be attacked a circular letter was sent to the men who are known to have published in this field. Replies, many of them of generous length, were received from forty-five, about two-thirds, of them. A none too satisfactory attempt at tabulation reveals that curriculum studies are considered most important at this time; forty-eight different problems in this field were proposed. Following are the numbers of problems proposed in the more popular fields: methods (21), organization (19), teachers (19), psychology (17), tests (16, of which seven concerned other things than subject matter), finance (9), prognosis (7), the principal (6), and supervision (6). One field of research strangely neglected during the past few years is the history of secondary education. As Professor D. H. Eikenberry, of the University of Missouri, writes:

Someone should write the history of the high-school movement from the beginning to the present time. Brown's *Middle Schools* covers the period to about 1900 only. Where can the student find a satisfactory account of the Commission on the Reorganization of Secondary Education?

A mere reading of the appended list of problems proposed for research shows that there is a tremendous amount of important work to do and that research workers are cognizant of the need. When we agree, as soon we must, on a reasonable and comprehensive philosophy of secondary education, there will be many more problems and even greater need for their solution. It is hoped that the points presented in this paper may aid us in bringing pressure to secure greater opportunity for competent men to obtain more time for research. In the meantime, and as further means, there are suggested other things that we may do: select problems of the greater worth, use approved technique, and induce the application in practice of the findings.

III. NEEDED RESEARCH IN HIGHER EDUCATION

F. J. Kelly

When the subject, "Needed Research in Higher Education," was proposed by the Chairman, I thought it was just one of those clerical errors we can all charge off to our stenographers. I assumed it was intended to be "Needed: Research in Higher Education." With that subject I am thoroughly at home. I am accustomed to using it to excuse all—or nearly all—of my exposed faults and failures in my own job. It is so easy and so satisfying to my acquired feeling for exactitude to say, with reference to any question in higher education about which I am being cussed out, "My dear sir, there is no statistical nor experimental evidence to support your contention." That has been a most effective silencer.

But when I saw the printed program the other day I observed that the subject was again stated "Needed Research in Higher Education." That is not so easy to discuss. It presupposes an analysis of the field of higher education, and it calls for a statement of a program of research suited to that field. Even if I were prepared to perform so difficult a task, it would be impossible to do more than make a bare outline of such an extensive program in this paper. What I shall undertake is a statement of a few of the more urgently needed researches in those aspects of higher education which would lend themselves to research by the devices and techniques already available if we but had the courage, the interest, and the facilities to carry on these studies.

Only last week there came to my desk from a member of a certain state legislature an inquiry about the University of Minnesota. He was evidently seeking in all honesty the sorts of information which a conscientious legislator should have in order to cast his vote intelligently. He is a well-educated man, fully able to interpret the facts he was asking for. We have all scolded bitterly because legislators in our own states are constantly casting their votes without knowing anything about the facts of the questions

being decided. Here then was a man after my own heart, and he should have the facts.

Among his fourteen questions was this: "What does the state contribute toward the education of each student in your University?"

The day the questionnaire came I read it half way through, tapped my pencil on the desk a time or two, and then threw the sheet into the tray to be answered later. The next day I read it again, shook a little dandruff down onto my coat collar, and threw the paper back into the tray. The third day, with my scientific fences repaired, I picked up my dictaphone mouthpiece and solemnly spoke:

MY DEAR MR. BLANK:

I appreciate the spirit which prompts legislators to seek information such as requested by your recent questionnaire. Even though it would require a considerable time to compile them, I would gladly furnish the data you wish if it were not for the almost utter impossibility of avoiding unfortunate misinterpretations and misunderstandings when the data from one institution are compared with the data from another. To illustrate the difficulty, let me use your first question: "What does the state contribute toward the education of each student?" Now, who are students? We have some who are on the campus but two periods a week. Are they students? We count them in our registration figures, but obviously their two hours per week do not cost as much as do the sixteen or eighteen hours of the full-time student. Again, what figure shall we use in getting the average student cost to the state? We have some courses, such as individual music instruction, for which the student pays the full cost. Such students increase the registration and thereby reduce the figure for average cost to the state of all students if we divide the total state contribution by the total student registration. Again, we have more than 4,000 students in the summer, who swell the annual registration figures, but who pay almost the entire cost of their education by fees. Shall they be counted? You see the question is so complicated that it is unsafe to answer it without careful definition of the terms.

You will, I am sure, therefore, excuse me for not attempting to answer your questionnaire.

Sincerely yours,

DEAN OF UNIVERSITY ADMINISTRATION

There! That ought to turn the trick, especially the signature, Dean of University Administration. Such a title! When I am not too busy to think about it, I feel about like any honest doctor must

have felt years ago when Kickapoo Indian Sagwa represented the crowning achievement of medical research.

Higher educational institutions, particularly universities, are the home of research. Anything we want to know, from the cause of wheat rust to the make-up of the atom, is given to the universities as a research problem. The answer is confidently expected. It is all the more singular, therefore, that the problems affecting the institution itself, the college or the university, should not have been attacked long ago. Men within the universities are at work on problems similar in character affecting both the elementary school and the high school, but they have so far given little attention to problems of higher education.

Research in higher education must involve two distinct techniques—statistical, having to do with data already available, and experimental, having to do with deriving new data. By means of each technique, several types of problems may be attacked, and of course the attack has been begun on a few of them. The paucity of results to date, however, is exceedingly depressing. Definition of terms is necessary prior to effective study of most of these problems, but I shall not take time to discuss that.

I. STATISTICAL STUDIES

Under studies calling for statistical procedures may be named:

1. *Cost Studies*.—I think the legislator's question is a fair one. For each curriculum we should know the cost per defined unit, whether the student credit hour, student clock hour, full-time student week, or some other unit. Those studies should indicate the distribution of costs among the major items, such as salaries for instruction, expendable supplies, permanent equipment, overhead expenses, and interest and deterioration on capital outlay. There should likewise be a distribution of income according to the major sources, such as state appropriations, endowments, gifts, student fees, sales, etc. It would then be possible to state readily the cost to each income source of the average full-time student per month, or per academic year, in any curriculum. That cost could be further stated in terms of salaries, supplies, or any other items in the distribution. The legislator who gets the sort of reply which I sent has

a perfect right to say, "Very well, if I can't get the facts, I have as good a right to my opinion as anyone else has, and my opinion is that the appropriations for the university in my state have been too large"—or (which is less likely) "too small."

Some fine scholarly men on our faculties complain that they don't want these factory methods introduced into our educational system. My answer is that they are already in. They always have been. There has not been a time when college presidents didn't talk in terms of cost per student enrolled. In fact, only a few years ago one state legislature published for the information of its members a table of costs per student in each of its several state-supported educational institutions. It was a perfectly simple process. The statutes told them how much money had been appropriated for the year, and the presidents of the institutions furnished the annual enrolments. The one figure divided by the other gave the annual cost per student. It was little concern of theirs that of two institutions having about four thousand annual enrolment each, one had about three thousand for nine months and one thousand for the summer term, while the other had about one thousand for nine months, and three thousand for the summer term. The much higher cost of the former institution was an evidence of bad financial management on its part. It is not a new method, therefore, but a refinement of an old method that I am advocating, a refinement that will substitute truth for half-truth or worse.

Detailed cost studies involving all these items are not needed every year. Perhaps every ten years, like the federal census, would be ample. Yearly reports on the highly variable factors, such as salary cost per unit, are essential.

Unit Costs of Higher Education, one of the volumes of the Educational Finance Inquiry Reports, is a good example of the more detailed study. Mr. E. B. Stevens, executive secretary of the University of Washington, joint author with President E. C. Elliott of Purdue University of the foregoing study, is also largely responsible for the annual reports of the Joint Board of Higher Curricula, in Washington, which represent excellent cost studies. Mr. W. O. Miller, comptroller of the University of Pennsylvania, publishes annually an excellent study of costs of the several curricula of that

institution. Other institutions publish less complete reports, but, largely because of the use of dissimilar items, or differently defined units, the reports allow only in small part for comparison among the several institutions. Considerable progress is being made, however, in the field of cost studies.

This point of comparison of institution with institution on the basis of unit cost is another sore spot with many of our good university men. And not without some cause. Until we have more effective methods of comparing products of instruction, there is danger that the institution showing the low unit cost will be regarded as the institution having the best financial management. Of course, it may be quite the reverse.

2. *Student Registration or Enrolment Studies.*—Among the most deceptive figures available on higher education, none are worse than the enrolment statistics. We still persist in speaking and writing about enrolments in terms of the number of different persons in attendance during a given period—usually a year. The federal bureau reports are lately beginning to call for more significant figures, thanks to the influence of the specialists in higher education in the bureau, but in general, enrolment figures mean nothing. It does not so much matter whether the unit is a student-day, a student credit-hour, or clock-hour, or what it is, so long as it bears a close relation with the amount of instruction involved. The Association of Collegiate Registrars is striving for the adoption of some significant unit, and we shall probably see progress made in that respect.

But merely to record attendance is of little value, at best. Registrations by departments and by terms reveal more worth-while facts. Total registrations will usually show a drop of 10 to 20 per cent from fall term to spring term, with no corresponding change in teaching staff. Furthermore, the load in credit hours taught by a given department will double or be cut in two from one term to the next with no change in teaching staff. Because of our common practice of regarding the summer term as an extra session rather than as a part of our academic year, it is not uncommon to have a whole department staff paid for half a teaching load during one academic term, then as many as are needed paid extra for teaching the summer term. Such practices would not persist if reports of

departmental registrations by terms were published regularly. Such figures were compiled five years ago for the University of Minnesota under the direction of Dr. J. B. Sears. Similar figures were again compiled last year. A marked change had taken place between the two years in the leveling up of the registration from quarter to quarter in the several departments. However, two of the colleges within the University have gone lately to the four-quarter basis in order to take still better account of the quarterly variation in registration by departments. Some of the faculty members of these two colleges in the departments having greatest variation now take their vacations when the registration is light, and teach in the summer quarter as a part of their regular nine months of service.

3. *Teaching Load*.—The third type of studies, mainly statistical, has to do with teaching load. We need accurate compilations of the data covering periods per week of teaching assigned to each teacher in each department, and the registration of students in each course, thus giving the student credits per teacher. Even if we had nothing more than this figure, comparisons of like departments among comparable institutions would be useful.

However, the chief need in respect to teaching load is for the following data, which must still be derived. (*a*) The relative weights as teaching loads to be assigned to elementary courses and to advanced courses in a given department; (*b*) the relative weights as teaching loads to be assigned to a department like mathematics, with relatively fixed content, as compared with, say, economics or English literature; (*c*) the relative weights as teaching loads to be assigned to courses taught by the discussion method and to those taught by the laboratory method. These questions assume major importance when we recall that standardizing agencies, as did the North Central Association of Colleges and Secondary Schools until recently, state the maximum hours per week of teaching, without making any distinction among departments. Because of such standards, the commonly accepted teaching load for all departments in a great many colleges today is 15 teaching hours per week. Furthermore, two hours of teaching in a laboratory is regarded as equivalent to one hour of classroom teaching.

Year before last I pooled the opinions of a number of college

deans with respect to this question of weighting. While the number of deans replying was not enough to be entirely conclusive, it seems safe to say that in the minds of those who are in the best position to view the question impartially it is no more of a load to teach 15 hours a week of elementary mathematics than 11 hours a week elementary psychology or than 8 hours a week of advanced philosophy. Furthermore, $1\frac{1}{2}$ hours teaching in the laboratory, rather than 2 hours, are equivalent to 1 hour in the classroom. Probably exhaustive investigation will change these ratios somewhat, but it is pretty certain that our present practice, which was fixed without investigation at all, is unfair to most departments.

4. *Additional Statistical Studies.*—Many other types of information should be made available by careful tabulations. I cannot do more than mention a few of them here: (a) Eliminations and retardations of students. (b) Content of courses with reference both to what students already know before entering the courses, and with reference to overlapping of content from course to course. (c) The growing tendency to make distributions of teachers' marks should become universal as a means of developing in the minds of college teachers the more objective method of evaluating students' work. (d) The faculty should be studied with respect to their (1) ranks; (2) training (one large university was surprised last year to discover that 71 per cent of all its faculty had been granted their highest degree by the institution itself); (3) experience; (4) salaries; (5) increases in salaries over a period of years; and (6) their contributions to scholarly literature. (e) Buildings should be studied from the point of view of the hours per week each room is in use, and the adequacy of the space for the uses to which it is put.

It will be readily recognized that in all these questions mentioned thus far I am pleading merely for a sort of survey which will make accessible, first to the institution itself and second to other comparable institutions, the facts mainly as they already exist about each institution. Surveys which have been made are of some help, but they are admittedly incomplete and, because of a lack of common definition of terms, they do not present data in terms comparable from one institution to another. It is hoped that the present agitation for a better-supported department or bureau of educa-

tion in the federal government will result in a plan for assembling information about higher education that will at once give us the needed data and relieve us from a portion of the flood of more or less meaningless questionnaires from students of the many phases of higher education.

II. EXPERIMENTAL STUDIES

By far the more important aspect of needed research in higher education is experimental. No other educational unit is so completely tradition-bound as higher education, and no other unit is as slow to make adjustments to meet changing social conditions. The experimental attitude is therefore greatly needed. Among the suggestions which seem most pertinent, the following may be made.

1. *Experimental Colleges.*—There is the same need for the support of a few colleges for purely experimental purposes as of the experimental elementary and secondary schools which are doing such excellent service. Colleges find it just as embarrassing as do the lower schools to try out new curricula, new methods, or new forms of organization under their present control, dependent, as they are, for their financial support upon taxpayers or upon necessarily conservative boards of trustees, or upon student fees. A college here and there, endowed for the specific purpose of experimenting with problems of curricula, methods, and organization, would do much to hasten essential readjustments.

2. *Studies of the Aims of Higher Education.*—No institution can long survive without a clear understanding of its essential aims or purposes. In an institution of social service, such as colleges, there must be constant re-examinations of these aims in the light of changing social conditions. A curriculum appropriate for training a pharmacist when he had to manufacture all his own drug compounds may be a very different thing from the curriculum appropriate for training a pharmacist when great drug manufacturers can supply his drug store with most of the compounds called for by the doctor's prescriptions. The curriculum appropriate for the medical doctor when his job involved the diagnosis and treatment in his community of everything from chickenpox to mastoid infections may be very different from the curriculum appropriate for a

medical doctor when his job is either general medical practice in communities where he will always have at hand in nearby hospitals the service of specialists, surgeons, and others, or his job is that of a specialist who sees only one type of case from morning till night. The curriculum appropriate for assuring a stable character when religious fear and traditional sanctions were powerful agencies in human control may be quite inadequate as a curriculum when universal education crowns intelligence as the supreme factor in human control.

Thus it becomes apparent that job analysis is the first requirement of the study of aims of higher education. Not job analysis of vocational or professional pursuits alone, but job analysis of twentieth-century life. In fact, the analysis of life, aside from its vocational or economic problems, the setting forth of its pushes and pulls, and the creation of adequate educational machinery to assure human conduct in line with public interest is probably the most urgent task before educators today. While the technique involved in job analysis is not experimental, the technique of making the subsequent readjustments in institutions of higher education is distinctly experimental.

3. *Learning Problems.*—What a multitude of things we do not yet know about the way people of different mental types and of different ages learn most effectively! What are the lasting values of courses taught as most of our college courses are: just so many assignments per week or per month or per term, with an “exam” at the completion of them, then the books sold to the second-hand bookstore and the memory decks cleared as far as possible for the work of the following term? What are the values of the lecture now so largely used as a method of college teaching? Does the study of mathematics induce within the awakening souls of students the sense of sublime beauty in the universal relationships of time and space? And if so, what sort of souls, and under what kinds of teaching? Scores of similar questions are yet without answers. Experimentation with problems of learning is greatly needed.

Something is being done with measuring the results of teaching classes of different sizes, the effort being made to keep all other factors than size of class constant. While no conclusions can yet be

announced, it seems likely that the conclusions reached in certain high-school experiments will be borne out, namely, that the results with large classes are on the whole as satisfactory as with small classes. Whatever the results of these experiments, the task will yet be only half performed. It will still be necessary to discover what technique of teaching is most effective with large classes, and what sort of subject matter, taught with what aims in view lend themselves to the favored technique.

4. *Adaptation to Different Intelligence Levels.*—Without raising the question of educational democracy nor the question of the aristocracy of brains, we may be allowed to say that college students are not all alike. Furthermore, the differences are such as to suggest that a common curriculum and a common method of teaching cannot be best for all. Up to date, we have largely contented ourselves in colleges with the smug assumption that our portion is for the elect, those young people with "college levels of ability." It has disturbed us but little to be told that the boys have just as good ability as the girls, but that we continue to dismiss many more boys than girls because they prove not to be among the elect. Likewise, our calm remains undisturbed when young people of acknowledged ability find themselves cast into outer darkness. Our job, we say, is to teach those who want to learn and are capable of it. If we were more discriminating in our speech we would say our job is to teach those who want to learn *our stuff* in *our way* and are capable of it. By this manner of speech would we bring into question *our stuff* and *our way* as we rarely do at present. Thanks to a small band of psychologists, our colleges are beginning to be forced to question *our stuff* and *our way* in the light of student personnel information which they are beginning to put into our hands. It is beginning—just beginning—to dawn upon us that two things are about equally important: (a) To know our subject matter, and (b) to know our students. But what a long way we have to go, and how difficult is the experimentation both to discover and classify differences among students and to adjust our college materials and methods to those differences. In no other way, however, can we claim to be giving equal opportunity to all. All praise to the institutions, such as Swarthmore College (and there are a goodly number now), which

are recognizing that superior students need a different curriculum and a different method of study from those adapted to the student body as a whole.

5. *Measuring the Results of Teaching.*—Next to establishing the true aims of the college, nothing is of more fundamental importance than the means of measuring the degree of success of our efforts at attaining those aims. All the objective evidence there is to date, as well as nearly all the best opinion of college officials, tends to show that teachers' marks in college courses have three faults: (1) they have a large measure of subjectivity, and are therefore not very reliable; (2) they serve as an artificial incentive to students to work throughout the course, rather than as a measure of the lasting value which the students have derived from the course; (3) they tend to center the attention of the learner upon the marks as ends of education, thus making him strive rather to do what he is told than to develop his own initiative, to remain a pupil rather than to become a student. If these charges are true to any considerable degree, then surely we do not have to urge the significance of experimentation with new forms of tests and examinations. The comprehensive examination which is now coming into use in a number of colleges—particularly where honors curricula are being introduced—is most hopeful. Objective examinations are slowly but surely winning their way among college teachers. Standardized tests of certain preparatory subjects like elementary languages are being hastened by the nation-wide investigations of Latin and modern foreign languages now under way. But much is yet to be done before we can hope to turn the attention of students from marks as ends to marks as a means of helping them analyze their own problems of self-education.

The foregoing five types of studies—and many more might be added—calling for experimentation surely serve to show what a virgin field college administration on an objective basis is. When coupled with the woeful lack of statistical data, as pointed out in the first section of this paper, it seems to justify a loud cry to scholars in education, "Come over and help us."

IV. THE DEVELOPMENT OF ABILITY IN RESEARCH

S. A. Courtis

One of the important functions of college teachers of education is the development of research ability in their students. The purpose of this paper is to present a theoretical analysis of the developmental process, to formulate related research problems, and to appeal for their co-operative solution. The paper offers the working hypothesis so essential to initial attack. It is to be hoped that in a few years it may be followed by generalizations based upon results of the experimentation to which it directs attention.

At the very outset, however, it must be recognized that current views in regard to the development of research ability differ widely. A consideration of the two extremes of views may serve to reveal the entire range of opinion.

The extreme conservative regards research as dangerous. He has experienced the changes in thought and social life brought about by past discoveries, and while he grudgingly admits that truth must prevail, he is far from convinced that the changes which have taken place in his lifetime have all been brought about by intelligent application of newly discovered truth. He believes research should be restricted to the gifted few, so well trained that they may be counted upon to weigh their conclusions well before giving them to the public and so "safe and sane" in their views that no revolutionary conclusions will be reached. He would broadcast only favorable data. Disturbing results and conclusions should be reserved until proper solutions are found. The conservative is necessarily an autocrat and believes in caste, indoctrination, and control.

The extreme radical, on the other hand, regards research as a universal activity. His dissatisfaction with the existing order leads him to welcome every aid to what he conceives to be progress, and he would develop in each individual, to the maximum of his capacity, not only a favorable attitude toward research and progress, but ability to carry on independent research studies. He believes that

all criticism is a stimulus to progress, that all research results are educative, and he would publish freely all the products of research.

Perhaps it is only fair to add that this paper is presented by one who has far more sympathy with the radical than with the conservative point of view.

In order that each one of you may similarly "place himself," as regards the development of research ability, between the two ex-

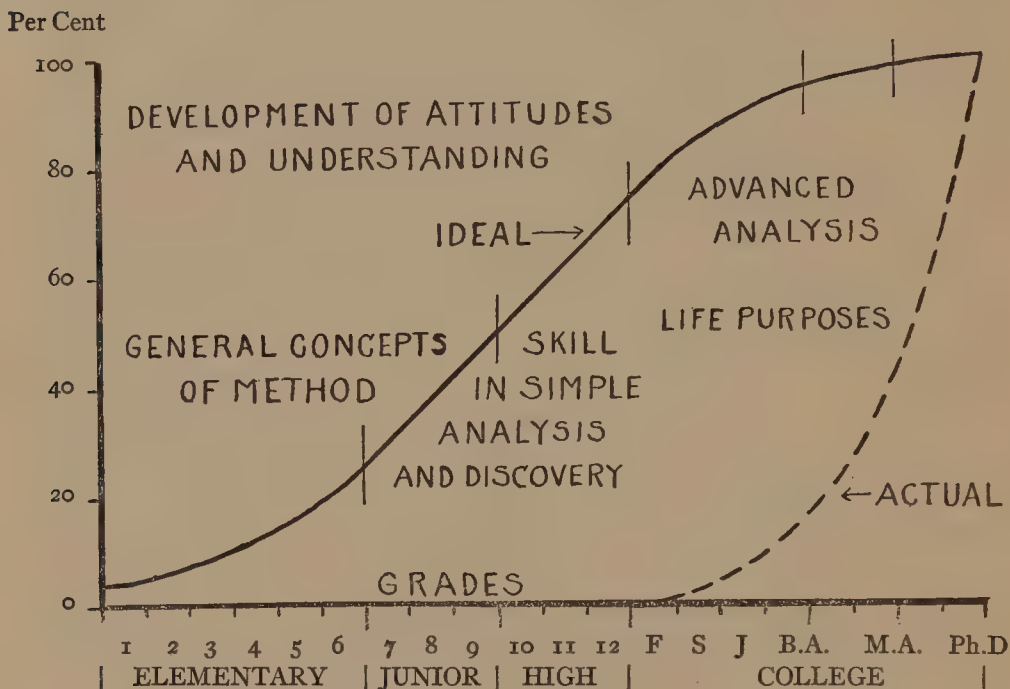


FIG. 1.—The development of research ability

tremes, I have expressed in graphic form (Fig. 1) what I conceive to be the differences in practical curriculum-making which would result from the application of such convictions. The curve marked "ideal" is based on the radical viewpoint. Since childhood is essentially the exploring research period of life, the radical would dethrone the three R's, abolish all formalized subject matter, and organize the curriculum of the elementary school around simple research activities. Reading, writing, and arithmetic would be learned, but incidentally, through use as tools which aid in experimental exploration of matter and energy, plants, animals, man, society, and all the other interesting products of cosmic evolution.

The teacher would aim to keep curiosity alive by feeding it ever more stimulating and novel material. He would develop general concepts of method and technique. By the end of the elementary school a twelve-year-old normal child would not only know from first-hand experience much about himself and the world he lives in, but also—and this is a much more important matter—how knowledge arises and how, properly used, it results in control.

The intermediate and high-school period would be devoted to more formal training in research. Development of skill in simple analysis and discovery would be the aim. At the end of the period, the individual, having personally explored to a degree, directly or vicariously, the whole of the known universe, and having made a choice of his own field of service, would then be in a position to devote the college period to productive research in his field of specialization. To the radical, development of research ability is a problem for the elementary and secondary schools. He would accept no candidate for college work who had not achieved understanding control over the scientific method and who did not exhibit in his own thought and conduct the scientific attitude of mind.

Actual conditions in our schools and colleges, however, approach much more nearly conservative conditions. There is little true research on high-school or undergraduate levels. The average bachelor of arts knows less about the technique of research, has assimilated less of the openmindedness and truth-seeking attitude of the scientist, than the radical would think desirable as a goal for the sixth grade. Very many of our college graduates find themselves solely responsible for a piece of research work for the first time in their lives when they enter upon the preparation of their Master's or Doctor's dissertations. The practical problem of the immediate future, therefore, is how to develop research ability in college students after twelve or more years of training in unquestioning acceptance of the dogmatic statements of authority.

The basic hypothesis upon which my thinking is based is that training in research involves developmental control of three types of factors, namely, (1) The emotional factors which furnish the drive. (2) The knowledge factors which determine efficiency. (3)

The volitional factors which fix control. I wish to discuss each of these briefly.

In education we have tended to minimize the emotional factors, yet all the values of life come from the emotions. I do not believe we can develop research ability if we do not plan consciously to arouse and to minister to three powerful emotions: curiosity, pleasure, and the desire for betterment—which I like to call utility. This last involves service to others as well as service to self.

Children are naturally curious, but parents, school teachers, and adults generally use such vigorous measures in repressing natural expressions of curiosity that the average college student wears a cloak of indifference that is as hard to penetrate as a coat of mail. Our problems in the arousal of curiosity are: (1) The discovery of effective stimuli. (2) The measurement and classification of their stimulating power. (3) The discovery of methods of adapting stimuli to individual differences.

My thought is that we college teachers not only ought to experiment deliberately, but ought quite as consciously to share our experiences with others until we have built up a body of material and a methodology adjusted to our students' needs. For instance, I have found one of the most effective means of stimulating a real interest in an experiment is to present as a question some debatable matter, as whether one ought to work for speed first, then accuracy, or vice versa, and call for written opinions. Whatever else the college student may not be able to do, he always has convictions. Collection of these written statements from a class of twenty-five inevitably reveals marked differences of opinion. In the defense of these opinions more heat than light frequently develops, and both parties turn eagerly to experimentation suggested by the instructor as a method of harmonizing the conflicts of opinion.

A second expedient I have found effective is that of presenting conflicting evidence. Study A is arrayed against Study B and the matter submitted for class consideration. Almost invariably a real desire arises to settle the matter by repeating the experiment themselves.

A third device which I have found very effective is to carry a class part-way through an experiment and at a crucial stage call

for prophecy as to what will happen. In other words, any means which will tie the student into the experiment and make it his own will arouse an emotional drive which will transform dull routine into living vital research.

Of pleasant motive, little need be said. It is a psychological truth that any activity once under way toward a definite outcome is intriguing in and of itself. For research, this means two things: (1) Students must be taken into our confidence more than they have been in the past. They, too, must "see" (fore see) the end from the beginning. (2) More emphasis than in the past must be placed upon creative self-expression through recognition, rewards, marks, etc.

We must be willing to forego finish, scholarly perfection, high standards, and accept the imperfect contributions of the first faint stirrings of creative effort. Most of us kill off by our exacting standards whatever of creative impulse there may be in our classes.

The development of appreciation of the motive of social betterment is less a matter of simple emotion and more a product of enlightened understanding. The degree of understanding depends upon the nature and extent of an individual's background. Therefore, in addition to the problems previously listed, a new one arises, namely, the technique of measuring the background the student brings to his work, of supplying his deficiencies. For instance, I have found very effective the assignment of biographical sketches of great scientists like Pasteur, brief accounts of the reception given important inventions like the cotton gin, and historical studies tracing the social consequences of great discoveries. The students that come to me seem to have a very limited view of life as a going concern. They discover with apparent interest that men in other ages have been faced with the same kind of problems as themselves and have lived interesting and even thrilling lives. So far as a halo can be developed for the past, it carries over to the experimental work of the present. I must confess I play up shamelessly the idea that by becoming experimentalists themselves they are joining "the choir invisible of those immortal dead who live again in minds made better by their presence."

I need not dwell on the knowledge factors; they are familiar

to you all. There are two basic problems: (1) the selection and organization of curriculum materials, and (2) the problem of method. You know these problems as well as I. May I point out, however, that there is just as much reason for the experimental solution of the problems of college teaching as for the experimental solution of the problems of method in the elementary school. Why should not we determine by co-operative experimentation: (1) Whether it is better to teach a statistical technique before, with, or after a felt need? (2) Whether mass or individualized instruction produces better results? (3) The value of control through standard tests?

Fortunately such experimentation is beginning to find a place in our programs.

As I see it, the list of our knowledge problems, and I shall content myself with listing them, is as follows: What are the best methods of training students (1) To utilize the results of previous research. They must be able to locate, critically evaluate, select, and organize for their purposes existing material. (2) To acquire understanding efficient control over the experimental procedures of inductive experimentation and deductive reasoning. (3) To construct and standardize and use appropriate measuring instruments. (4) To be familiar with, and employ readily and appropriately, the various analytical techniques—statistical, graphic, etc. (5) To be able to generalize effectively; to be readily responsive to the opportunity for generalization and yet to be properly appreciative of the limitations and restrictions of generalization. (6) To give proper place to verification; to accept critical evaluation in terms of verification of prediction as the sole criterion of truth for self as well as for others. (7) To be masters of formulation; to be able to select, organize, and publish in form best available for others the results of productive work.

The volitional factors are closely akin to the emotional factors, but yet are quite different. We tend commonly to ignore them. They are, however, the critical factors; for even if the obvious things are well done, failure will result if the volitional factors are neglected.

On the other hand, they are intangible, exceedingly difficult to locate. Visible evidences of their operation are such traits as courage in attacking difficult problems, persistence, openmindedness, humility, faith in self or reality, etc. The general powers resulting from the volitional factors are equally easy to name. For instance, self-direction, self-appraisal, self-control, etc., are direct products of a well-trained will. The real problem is how to develop volitional control.

There are two things to be said. The first is that the only way to develop control is to give students a chance to exercise choice. Students do not become open-minded by listening to sermons on open-mindedness, but by practicing open-mindedness. How can they practice if every item submitted for their consideration bears the official stamp of authority? Students cannot acquire power in self-direction except by exercising self-direction. How can they exercise self-direction if each step is dictated by an experienced guide? In my judgment we teachers need to appraise our work from the point of view of the volitional factors, and make sure by direct measurement that the opportunities we provide are adequate for the development of essential powers. Growth is a slow process at best and *cannot be hurried* unduly. Does our classroom practice conform to the laws of growth?

The second thing to be said is that apparently conscious will is an expression of well-organized convictions, and in the past we have paid too little attention to building up such convictions in our students. As I see it the important convictions are three in number: (1) convictions about nature, (2) convictions about self, and (3) convictions about opportunity.

It is my experience that those students make the best research agents who believe in the unity, continuity, and evolutionary development of the universe. The conviction that all nature is one, and that elements, concepts, divisions are abstractions which express only a part of the total situation seems to have a wonderfully steadying effect upon tendencies to hasty or imperfect generalization. The student who appreciates the manner in which the past has conditioned the present, and the present, the future; who be-

believes that change is not only continuous but cumulative, brings to research something which affects directly the operation of the will. Such an individual usually has made for himself the differentiation between chance and cause and effect; between luck and law. He has an abiding faith in the possibility of the discovery of law, which makes for courage, persistence, and the other virtues listed. Also, he appreciates the utility of law from the point of view of control; he believes in "freedom under law." So that to his natural emotional tendencies of curiosity, pleasure, desire for comfort, etc., is added a far higher and more potent emotion born of reasoned conviction. A person's conviction in regard to the nature of nature, therefore, is a matter of supreme importance. Its development would seem to be worthy of direct study and effort.

Almost equally potent are an individual's convictions in regard to himself and the relation of self to others. "The inferiority complex" has become a joking matter, but do we not need to ask ourselves how far our methods and teaching are directly building up undesirable inhibitions. My personal belief is that we should aggressively attack the problem of revealing the student to himself; of inspiring him to effort; of getting him to see the potentialities of his inheritance, both biological and sociological. We have a duty to perform in awakening the social consciousness of our students. There is a legitimate desire for fame which it is our duty to arouse, and it is from us that the student should acquire the idea that self-control, self-sacrifice, establishment of right habits of work, and all those other items which make up the ideal of proper self-development are as important fields for the study, effort, and mastery that make for success as the external fields to which we ordinarily direct his attention. In other words, my thesis is that "personality culture," as some would contemptuously call it, is such an important part of our job that it merits our best attention.

Finally, a sovereign duty in the development of research ability is to give the call to service. We must regard ourselves as recruiting officers, the mouthpieces of society, the voice of God crying the desperate need of the world in its battle with lust, ignorance, and ambition, and appealing for volunteers. It is our part so

to interpret life's problems that the members of our classes will respond, dedicating themselves body, mind, and soul to the pursuit of truth. The ills of society can be cured only by co-operative effort, co-operation between sovereign wills, and is possible only when a basis of harmonization of conflicts of opinion is recognized and utilized. The problem of development of research ability is really the basic problem of progress. To the degree that we achieve success in this phase of our teaching, therefore, to that degree we further the collective struggle for human betterment.

V. CURRICULUM-MAKING IN MORAL EDUCATION

Ernest Horn

Professor Horn's interesting account of the principles underlying the making of a curriculum in moral education was given from notes at the Tuesday afternoon meeting, but owing to the pressure of other duties, Professor Horn has been unable to prepare a manuscript for publication.

VI. APPORTIONMENT OF STATE SCHOOL FUNDS

Fletcher F. Swift

Professor Swift's presentation of this important topic was made from lantern slides and cannot be reproduced adequately here. However, certain of this data are given that those interested may draw conclusions for themselves.

BASES OF APPORTIONING STATE GENERAL SCHOOL FUNDS IN THE UNITED STATES, 1926¹

SUMMARY

Basis of Apportionment	Number of States Employing
I. Per pupil bases:.....	45
1. School census.....	28
2. A.D.A.....	8
3. Aggregate attendance.....	5
4. Enrolment.....	4
II. Per teacher bases:.....	16
1. Number of teachers, regardless of salaries or qualifications	8
2. Graduated grants proportioned to salaries paid.....	5
3. Graduated grants proportioned to qualifications.....	3
III. Equalization funds:.....	23
1. Entire state aid (New Hampshire).....	1
2. Additional to other aids.....	22
IV. Miscellaneous.....	16

¹ Based chiefly on school codes of 1923, and excluding funds appropriated for special projects, e.g., vocational education, high-school training departments, *et. al.* Subject to revision and correction.

BASES OF APPORTIONING STATE GENERAL SCHOOL FUNDS IN THE UNITED STATES, AND STATES EMPLOYING THE SAME, 1926¹

A. PER PUPIL BASES

I. School census (school census as the sole basis):

States	Census Age
Ala.....	7-21
Ark.....	6-21
Ga.....	6-18
Idaho.....	6-21
Ia.....	5-21
La.....	6-18
Mich.....	5-20
N.D.....	6-21
Okla.....	7-21
S.D.....	7-20
Va.....	7-20
Wyo.....	6-21

SUMMARY

Census Age	No. of States
5-20.....	1
5-21.....	1
6-18.....	2
6-21.....	4
7-20.....	2
7-21.....	2

School census combined with:

1. Enrolment: Utah.
2. A.D.A.: Ariz.
3. A.D.A.; Miscellaneous bases; and Equalization fund: Conn.
4. Aggregate attendance; No. of teachers; Equalization fund and misc. bases: Me.
5. A.D.A.; Aggregate attendance; Graduated teacher grants on basis of salary and qualifications; Equalization fund and miscellaneous bases: Md.
6. Equalization funds only: Col., Kan., Ky., Mont., N.M., Tex., W.Va.
7. Number of teachers and equalization funds: Nev., Pa.
8. Miscellaneous: Minor population, graduated teacher grants: Conn., Ind.
9. Miscellaneous bases: Ore., Wis.

II. Average daily attendance:

Average daily attendance as the sole bases: Fla.

¹ Based chiefly on school codes of 1923.

Average daily attendance combined with:

1. School census: Ariz.
2. School census; Misc. bases; and Equalization fund: Conn.
3. School census, etc. (See I, 5 above.) Md.
4. Number of teachers and special grants: Calif.
5. Aggregate attendance; No. of teachers; and Graduated salary grants: Mo.
6. Miscellaneous grants: Tenn.
7. Enrolment; No. and qualifications of teachers; and Miscellaneous bases: Del.

III. Aggregate Attendance:

Combined with:

1. Graduated grants on basis teachers' salaries and qualifications, and miscellaneous grants: Ill.
2. Assessed valuation and Equalization fund: N.J.
3. Miscellaneous bases: Wash.
4. School census, etc. (See I, 4, above.) Me.
5. School census, A.D.A., etc. (See I, 5, above.) Md.

IV. Enrolment:

Combined with:

1. A.D.A.; Number and qualifications of teachers, and misc. bases: Del.
2. Equalization fund and misc. bases: Nev.
3. School census: Utah.

V. Attendance for fixed period:

1. Forty days' attendance combined with special grants and equalization fund: Minn.

B. PER TEACHER BASES

I. No. of Teachers Employed; No Proportioning of Aids to Salaries or Qualifications

II. Grants Graduated According to Salaries Paid

III. Grants Graduated According to Professional Qualifications

- | | | |
|--------------|-----------|------|
| 1. Cal..... | Ill..... | Ill. |
| 2. Del..... | Del..... | Del. |
| 3. Me..... | Md..... | Md. |
| 4. Mass..... | Mass..... | |
| 5. Mo..... | Mo..... | |
| 6. Nev..... | Pa..... | |
| 7. N.Y..... | S. C..... | |
| 8. Vt.*..... | | |

* Only in the case of helping teachers.

C. ASSESSED VALUATION BASIS

I. Combined with:

1. (1) No. of teachers, (2) Graduated grants proportioned to teachers' salaries and qualifications, and (3) Miscellaneous bases: Mass., Pa.
2. (1) No. of teachers, (2) Miscellaneous bases: N.Y.
3. A factor in all equalization funds: 23 states (see under E, below).

D. MISCELLANEOUS BASES

Bases	States
1. Per capita of total population.....	Miss.
2. Adult males.....	Ohio*
3. Minor population.....	Ind.
4. Graduated grants per high school pupil proportioned to assessed valuation.....	Vt.
5. Per teacher; school day; graduated grants proportioned to assessed valuation (dist.).....	Ill.
6. Amount districts have contributed to permanent school fund.....	Ohio
7. Taxes where paid.....	N.J., Ore., Minn.
8. Wealth per child.....	Mass.
9. Per teacher; graduated grants proportioned to assessed valuation.....	Conn.
10. Per district.....	Neb.
11. Number of schools.....	R.I.
12. Per county.....	Tenn.
13. High school grants proportioned to number of years of course offered.....	Calif., Wash.

* Swamp-land fund income.

EQUALIZATION FUNDS

Twenty-three states providing funds:

1. Col.	9. Miss.	17. Ohio
2. Conn.	10. Mont.	18. Pa. ²
3. Ind.	11. Neb.	19. R.I.
4. Kan.	12. Nev.	20. S.C.
5. Ky.	13. N.H. ¹	21. Tex.
6. Me.	14. N.J.	22. Vt.
7. Md.	15. N.M.	23. W.Va.
8. Minn.	16. N.C.	

Twenty-five states not providing funds:

1. Ala.	9. Idaho.	17. Okla.
2. Ariz.	10. Iowa	18. Ore.
3. Ark.	11. La.	19. S.D.
4. Calif.	12. Mass. ³	20. Tenn.
5. Del.	13. Mich.	21. Utah
6. Fla.	14. Mo.	22. Va.
7. Ga.	15. N.Y.	23. Wash.
8. Ill. ⁴	16. N.D.	24. Wis.
		25. Wyo.

¹ Entire state current school fund used as an equalization fund.

² No separate equalization fund, but the principles involved in equalization funds receive some recognition in the distribution of the major portion of state aid.

³ No separate equalization fund, but the principles involved in equalization funds receive recognition in the distribution of other state school funds.

⁴ See footnote 2.

#

MARYLAND STATE EQUALIZATION FUND—RESULTS
COMPARISON OF ABILITY WITH EQUALIZATION AID AND
TOTAL STATE AID (1924)

COUNTIES	WEALTH PER TEACHER*†		PER CENT OF TOTAL CURRENT EXPENSES RE- CEIVED FROM ALL STATE FUNDS§		STATE AID PER TEACHER*			
					EQUALIZATION FUND		FROM ALL STATE FUNDS	
	Amt. in 1000's of Dollars	Rank‡ in Need	Per Cent	Rank‡	Amt. (Dollars)	Rank||	Amt. (Dollars)	Rank‡
Calvert.....	68	1	60	1	205	3	651	1
Worcester.....	102	6	45	6	167	4	548	3
Caroline.....	103	7	39	9	60	10	480	10
Prince George's.....	126	11	39	10	118	6	522	6
Carroll.....	131	12**	27	19**	f	f**	341	22**
Kent.....	135	13	32	13	30	12	405	16
Talbot.....	136	14**	29	18**	f	f**	413	15**
Hartford.....	152	17	31	15	f	f	392	18
Cecil.....	158	18	31	14	20	13	430	12
Howard.....	161	19**	34	12**	f	f	433	11**
Baltimore.....	266	23	19	23	f	f	374	20

* Includes white and colored.

† Computed from data from *Maryland State Board of Education Report* (1924), p. 200, col. 5; p. 247, col. 18; p. 251, col. 9.

‡ Rank among 23 counties.

§ *Report of Maryland State Board of Education* (1924), p. 160.

|| Rank among 14 counties; 9 counties received no aid.

** Marked failure to equalize.

¶ Those receiving no aid from equalization fund are designated "f."

MARYLAND TOTAL SCHOOL RECEIPTS, 1924, AND PARTIAL
PER CENT ANALYSIS OF SAME*

	Percentage
Equalization fund.....	2
Census and attendance fund.....	13
Other state funds.....	6
<hr/>	
Total receipts provided by state.....	21
Total state aid provided by equalization fund.....	8
Census and attendance fund.....	65
Other state funds.....	27
County general property tax.....	77
Other county sources.....	2
<hr/>	
Total receipts provided by counties.....	79
Total receipts†.....	\$15,125,345.53

* All data from *Maryland State Board of Education Report* (1924), Tables XX and XXI, pp. 250-51.

† Excluding \$7,076,544.28, consisting of balances from previous year, \$974,283.76; proceeds of property sales, \$38,025.67; proceeds of bond sales, \$6,064,234.85.

APPORTIONMENT OF STATE SCHOOL FUNDS 101

STATE AID IN NORTH CAROLINA¹

I. Three state school funds.

1. State Permanent Literary Fund: Principal (1922), \$1,028,117.00. Available to counties and districts as a building loan fund.
2. Special Building Fund. Created 1921 by bond issue of \$5,000,000. Loaned to counties and districts.
3. Public School Fund (set aside from ordinary state revenues). Sources:² (1) Corporation franchise tax. (2) Inheritance tax. (3) Privilege and license tax. (4) Graduated income tax.

II. State equalization fund (1923). Amount, \$1,250,000.

1. Establishment: \$1,250,000 set aside from the state public school fund. Purpose: To enable all counties to provide six months' school and teachers of minimum salaries and minimum qualifications.
2. How state department determines the counties' share of equalization fund:
 - (1) Determines for each county for the last two years:
 - (a) The number of teachers allowed.
 - (b) The cost for six months of the actual salaries of teachers and principals according to state salary schedule.
 - (2) Averages the salary costs for the last two years. This average is the "allowed salary cost" for the *next year*.
 - (3) Estimates the yield of a *three mill* general property tax in each county (3.9 mills in 4 counties).
 - (4) The "allowed salary cost" *less* the proceeds of the three-mill county tax, *plus* one-half the salary of the county superintendent is the county's share of the state equalization fund.
 - (5) Deductions for excess expenditures. From the county's share of the equalization fund must be deducted any excess above the state average per capita cost of instruction.
3. \$30,000 of equalization fund set aside as county school transportation aid.
4. Balance, if any, distributed as aid to more needy counties or returned to equalization fund.

HOW ILLINOIS APPORTIONS HER COMMON SCHOOL FUND

SCHOOL DISTRICT BUDGET³

Report of School District No. —, — County, to the County Superintendent of Schools for the school year ending July 1, 19—.

¹ State divided into one hundred counties, subdivided into several thousand districts.

² No state general property tax.

³ Condensed from Illinois State Department of Education Circular (1923), No. 176.

GENERAL INFORMATION

1. Total number of days school was in session.....
2. Total aggregate days of pupil attendance.....
3. Average daily attendance of pupils.....
4. Total number of full-time elementary teachers employed.....
5. Total assessed valuation of districts.....
6. Equalized assessed valuation per full-time teacher.....

BUDGET INFORMATION:

DISTRIBUTION OF COMMON SCHOOL FUND¹

- I. *Teacher-school-day quotas:*
 - a) Total number of teacher-school days.....
 - b) Amount per teacher-school day.....
 - c) Amount due district (*a* times *b*).....
- II. *Equalization quotas:*
 - a) Assessed valuation per full-time elementary teacher.....
 - b) Amount per teacher-day as determined by section 211 of this Act.....
 - c) Total number of teacher-school days.....
 - d) Amount due district (*b* times *c*).....
- III. *Elementary teacher-training quotas:*
 Number of full-time elementary teachers employed:
 - a) Having not less than 18 weeks normal training or equivalent:
 1. Total number of teachers.....
 2. Number of school weeks.....
 3. Weekly rate per teacher.....
 4. Maximum amount available..... \$.....
 - b) Having not less than 36 weeks normal training or equivalent:
 1. Total number of teachers.....
 2. Number of school weeks.....
 3. Weekly rate per teacher.....
 4. Maximum amount available..... \$.....
 - c) Who are normal graduates or equivalent:
 1. Total number of teachers.....
 2. Number of school weeks.....
 3. Weekly rate per teacher.....
 4. Maximum amount available..... \$.....
 - d) Additional quotas to one-room rural districts employing a normal-school graduate or equivalent for at least thirty-six weeks..... \$100.00
- IV. *Quotas based on pupil attendance:*
 - a) Total number of days attendance.....
 - b) Rate per pupil day.....
 - c) Maximum amount available (*a* times *b*)..... \$.....

¹ For elementary schools only.

APPORTIONMENT OF STATE SCHOOL FUNDS 103

- V. *Total amount due district for teacher-training and pupil attendance (III plus IV)*.....
- VI. *Local district rate:*
a) Educational rate.....
b) Textbook rate.....
Total rate.....
- VII. *Grand total due district from state common school fund (Total of I, II, V, VI)*.....
- We hereby certify that the above is a true and correct report as shown by the records of this district.

Superintendent, Principal, or Teacher

Secretary of Board of Directors, or Education

Dated this _____ day of _____, 19_____.

RESULTS OF ILLINOIS NEW (1923) METHOD OF APPORTIONING HER COMMON SCHOOL FUND (1924)*

NINE SELECTED COUNTIES	ASSESSED VAL. PER ELEM. TEACHER†‡	STATE AID PER TEACHER	COUNTY'S RANK IN		QUALIFICATIONS OF ELEM. TEACHERS (PER CENT LESS THAN NORMAL SCHOOL GRADUATES‡)
			Need	Aid	
Cook.....	\$173,500	\$321	10	1	7
Henderson.....	119,500	196	8	9	84
Togan.....	168,500	215	9	7	68
Bureau.....	109,500	218	6	6	79
Hancock.....	94,000	182	4	10	87
Knox.....	110,900	226	7	4	66
Kankakee.....	97,100	216	5	5	73
Pulaski.....	45,200	243	1	3	90
White.....	46,400	256	2	2	89
Gallatin.....	52,000	206	3	8	88

* Report of Illinois county and state school budgets for year ended June 30, 1924. Selected among total of 102 counties on basis of rank in assessed valuation per teacher, 1923.

† Full-time under principals, teachers, and supervisors.

‡ Computed.

RESEARCH STUDIES

I. LIMITATIONS OF THE SOCIAL PRINCIPLE IN MAKING A CURRICULUM

Frederick S. Breed

The tadpole's tail, made famous in the charmingly sonorous pages of Stanley Hall, is now threatened with amputation and disaster. The resort to surgery on this innocent organ by certain members of the sociological school of curriculum-makers is defended by them on two counts: (1) No properly developed frog needs this appendage, and (2) tails don't belong on these animals, anyhow. I shall attempt to show that the first statement is not a valid argument for denying the use of this appendage to the young or for imposing other methods of navigation, and that the second statement is a proposition contrary to fact.

We are living in a period of stimulating curriculum reform. During the past quarter of a century the orientation of the curriculum has been based largely on the behavior of children. Now it is to be based on the behavior of adults. We are invited to make a delightful swing from one extreme to its opposite. Analysis of adult activities will provide our major objectives, which, upon further analysis, will yield the detailed materials of the courses of study. Man, the measure of the selection of materials; the child, the measure of their gradation—this is the new gospel and slogan.

Now, let it be observed that few of the advocates of this engaging doctrine have ventured beyond the point of determining major objectives. Their program is still largely in the theoretic and preliminary stages. When the analysis of the leading activities and aspirations of adults is consummated, may we expect it to produce the content of a satisfactory course of study? In the most conspicuous case of such refined analysis the results enable us already to answer in the negative. It has been found that a spelling vocabulary based on the written discourse of adults has two outstanding deficiencies: (1) It provides the child with a considerable body of material *beyond* his intellectual level, and (2) it deprives the child of much material *at* his intellectual level. This has been shown by

means of a detailed comparison of two composite vocabularies, one derived from eleven investigations of adult correspondence and the other from five investigations of children's themes.¹ Nearly half (4,459) of the words in the adult composite did not appear at all in the composite vocabulary of children. Careful analysis showed that the words used only by adults represented business and professional objects and activities; social, political, and religious notions; or general and abstract ideas, for the most part clearly beyond the mental and social maturity of the child. "Advisability," "comprehension," "diversion," "extension," "facilities," "beneficent," "chronological," "feasible," "hospitable," these represent the type of words in this group. Their non-appearance in the childhood lists is easily explained on psychologic grounds.

On the other hand, children were found to have word needs not included in the vocabulary of adults. The most striking examples are presented in the following group of words found in each of the five investigations of children's themes and in no one of the eleven investigations of adult correspondence:

bonfire	dive	insect	sled
cannon	elephant	kite	squirrel
cart	giant	noble	tiger
curl	Indian	onion	violet

When the 2,437 words found only in the writing of children were classified, they fell naturally into the following categories, which I list in the descending order of their frequency:

School	576	Food	106
Stories	465	Farm	70
Home	358	Plants	68
Conduct	229	Health	54
Animals	188	Clothing	44
Play	134	Miscellaneous	145

These categories, differing strikingly from those required for the classification of the adult-only words, suggest familiar fields of interest, general and fundamental in their appeal to children; and the number and character of the words within the categories make

¹ Frederick S. Breed, "What Words Should Children Be Taught to Spell?" III. Limitations of the Adult Standard of Selection, *Elementary School Journal*, XXVI, No. 4 (1925), 292.

it clear enough that the word needs of children differ markedly from those of adults.

It was found, moreover, that the distinctive elements in the two vocabularies cannot be explained, as one writer has claimed, on the ground of the unreliability of the childhood lists. A study of the word lists entering into the two composites showed that they were about equally reliable, the childhood lists agreeing with each other to approximately the same extent as the adult lists. Furthermore, a study of the common element in the two composite vocabularies revealed marked differences in the frequency of use of the same words on the part of children and adults. The total divergence of the two vocabularies, after the totals were equalized, was 40 per cent.

Let us now be clear in regard to the real issue in this discussion. There is apparently no objection to the establishment of the ultimate goals of curriculum endeavor on the basis of adult behavior. I think we are all in favor of it. Even the extreme advocates of the project method will probably agree that teachers should perform their directive functions with these social ends in sight. The argument of this paper is rather that the analysis of adult activities is not an adequate source of materials for the curriculum. The results of such an analysis will require both supplementation and curtailment, for there will be sins of omission as well as sins of commission.

My esteemed colleague, Professor Bobbitt, whose subtle and influential contributions to the theory of curriculum construction have at times seemed tinged by the sociological heresy under discussion, has recently freed himself from all suspicion. In an article¹ on "The New Technique of Curriculum-making" he has stated his position with such definiteness that one need not remain in doubt about it:

. . . . The activity-analyst must see human activities within any field not as activities at any one particular age, but as a *series* of activities which take place at *all* of the age levels from infancy to old age. . . . *The analysis is to show what is normal for each of the levels.*

¹ Franklin Bobbitt, "The New Technique of Curriculum-making," *Elementary School Journal*, XXV, No. 1 (1924), 54.

This is indeed a reassuring clarification, lending support to the central contention of this paper. When I expressed my approval of this significant passage to the author, shortly after it appeared, he remarked, "Ah, you think I have changed my opinion, don't you?" I had suspected that he had at least indulged in a judicious amplification!

The research findings in the field of spelling are arrayed against an exclusively adult standard for the selection of the content of the curriculum. In a scientific course of study in spelling, the vocabulary of adults will not be substituted for the words which children need in order to write about the things and the activities that touch their deepest interests. And a similar outcome may be safely predicted in many other sections of the curriculum. Children will continue to profit by the reform initiated in America a hundred years ago under the leadership of Colburn and to study number relations within the range of childhood experience, while at the same time curriculum-makers will outline the objectives of the course of study after the method inaugurated by Wilson. Similarly, in acquiring the reading skill necessary for effective participation in social life, children will continue to use nursery rhyme and fairy tale, stories of adventure and animal life—all in a vocabulary that differs materially from that of the news reports on the front page of the daily paper.

The movement under discussion is in truth a resuscitation of the disciplinary doctrine, it is compulsory education in a new guise, and it is socialistic in its trend. Not social domination and denial of the individual, but respect for the objects and the activities that touch his deepest interests at every level of his development, with guidance in the light of socially determined ends—this, I venture to suggest, is the meaning of democracy in the construction of the curriculum.

II. INVESTIGATIONS OF TESTS AND EXAMINATIONS IN THE SOCIAL STUDIES¹

G. M. Ruch

INTRODUCTION

The general object of this series of investigations was that of gathering additional information concerning certain of the alleged defects of the traditional examination practices in the social studies, and to study the claims to superiority of various proposed *objective* examination techniques.

Some idea of the scope of the experimentation will be had by the following brief statements. A total of forty different booklets of test materials was prepared and used in the investigations, exclusive of about 100 pages of mimeographed examination questions used. . . . The total number of pages of printed test materials making up the forty booklets was 332 pages. All printed materials were set up in 10-point type on 8½x11-inch pages. . . . In all, 8,946 pupils took part in one or more experiments; the total pupil-working-time aggregating about 600,000 minutes or 10,000 hours.

The investigational staff included Dr. Mark H. DeGraff, Dr. Walter E. Gordon, Mr. J. B. MacGregor, Miss Nell Maupin, Mr. John R. Murdock, and G. M. Ruch (Director). Dr. Ernest Horn acted in the capacity of an informal adviser.

The general outline of the studies carried out under the general investigations is as follows:

- I. Studies on the reliability of state eighth-grade examinations.
- II. Studies on the reliability of the New York regents' examinations. (Official and objective versions of the same examinations were compared.)
- III. Studies on the relative merits of recall, multiple-response, and true-false examinations with reference to:
 - (a) Corrections for chance by the formula, $\text{Score} = R - (W/n - 1)$.
 - (b) Relative merits of instructions to "Guess" vs. "Do not Guess."
- IV. A study of the technique of matching tests.
- V. Studies of the comparative validities and reliabilities of standard tests in the social studies.

¹ A preliminary report of an investigation made possible by a grant of \$2,500 from the New York Commonwealth Fund.

The following pages present brief abstracts of selected portions of the tabular data for certain of the foregoing studies.

TABLE I
RELIABILITY COEFFICIENTS OF SIXTEEN STATE DIPLOMA EXAMINATIONS,
YEAR (1923) AGAINST YEAR (1924), AND SCORER AGAINST SCORER

No.	Key	Subject	(1)	(2)	(3)	(4)	(5)	(6)	Pop.
1...	G-2	Elem. Citizenship	.45	.21	-.05	.46	.34	-.26	102
2...	I-1	U.S. History	.60	.43	.16	.41	.23	.17	31
3...	J-1	U.S. History	.47	.30	.44	.73	.25	.22	32
4...	F-3	Geography	.58	.39	.37	.22	.17	.55	36
5...	F-1	U.S. History	.89	.99	.67	.64	.67	.69	94
6...	D-2	Civics	.82	.88	.22	.25	.33	.23	36
7...	I-3	Geography	.40	.88	.32	.48	.29	.41	32
8...	M-2	Civics	.80	.82	.47	.55	.46	.52	61
9...	D-1	U.S. History	.81	.22	.54	.65	.49	.35	34
10...	L-1	U.S. History	.79	.57	.73	.48	.45	.66	107
11...	A-1	U.S. History	.81	.85	.66	.71	.56	.65	42
12...	B-1	U.S. History	.53	.58	.36	.34	.27	.41	97
13...	B-2	Civics	.63	.20	.36	-.18	-.06	.25	82
14...	K-1	U.S. History	.93	.91	.56	.67	.68	.51	99
15...	I-2	Civics	.81	.53	.37	.27	.52	.46	35
16...	E-1	U.S. History	.75	.12	.26	.59	.60	.19	32
Averages.....			.69	.56	.40	.45	.39	.38	(952)
Averages by pairs of columns...			.62		.43		.38		

LEGEND

- Column (1) 1923 examination; scorer No. 1 vs. scorer No. 2.
 Column (2) 1924 examination; scorer No. 1 vs. scorer No. 2.
 Column (3) Scorer No. 1; 1923 examination vs. 1924 examination.
 Column (4) Scorer No. 2; 1923 examination vs. 1924 examination.
 Column (5) 1923 examination scored by No. 1 vs. the 1924 examination scored by No. 2.
 Column (6) 1924 examination scored by No. 1 vs. the 1923 examination scored by No. 2.

SECTION I

The six columns in Table I may be grouped as three general situations with respect to examination practices, viz.:

- Situation I. The examination is the constant and the scorer is the variable. This situation allows the factor of subjectivity of scoring to be the main variable, since two independent readers mark the *same* papers. Theoretically, aside from the subjective element in the marks, all correlations of this type would be unity (1.00). Columns (1) and (2) of Table I represent the actual coefficients.
- Situation II. The scorer is the constant and the examination is the variable. In this situation, the factor of subjectivity still enters, but in its minimum effect, since the *same* scorer read both sets of examinations. Such correlations, theoretically, must always be less than unity, since unreliability due to small samplings (5 to 10 questions) still enters in addition to unreliability due to what-

ever degree of subjectivity is non-eliminable even when the scorer is constant. We will expect correlations in Situation II to tend to be smaller than for Situation I. Columns (3) and (4) present the actual coefficients.

Situation III. Both the scorer and the examination are variables; the influence of both being at a maximum (within the limits of the present investigation). Here the 1923 examination was read by scorer No. 1 and the 1924 examination by scorer No. 2. The coefficients yielded by this situation will, theoretically, be smaller than in either of the two preceding situations, since it combines the sources of error present in both. Columns (5) and (6) present the actual coefficients.

In passing, it should be pointed out that the actual coefficients obtained are in harmony with the foregoing predictions as to relative magnitudes, the mean values being .62, .43, and .38 for Situations I, II, and III, respectively.

TABLE II
THE AVERAGE SCORES (MARKS) ASSIGNED BY TWO DIFFERENT SCORERS FOR BOTH THE 1923 AND 1924 EXAMINATIONS (THE SIXTEEN STATE DIPLOMA EXAMINATIONS)

No.	Key No.	(1) 1923 Exam. Scorer 1	(2) 1923 Exam. Scorer 2	(3) 1924 Exam. Scorer 1	(4) 1924 Exam. Scorer 2
1.....	G-2	67.5	82.0	73.0	70.4
2.....	I-1	71.7	67.1	57.0	71.0
3.....	J-1	68.1	43.6	64.9	45.6
4.....	F-3	70.0	54.8	70.3	69.9
5.....	F-1	47.7	45.3	51.4	41.9
6.....	D-2	55.7	47.5	65.6	59.1
7.....	I-3	51.0	62.3	50.4	68.9
8.....	M-2	51.0	48.6	48.5	42.9
9.....	D-1	38.3	34.4	48.5	30.7
10.....	L-1	49.3	56.5	38.3	65.3
11.....	A-1	42.5	28.1	25.3	18.6
12.....	B-1	14.4	7.7	24.4	25.3
13.....	B-2	29.3	26.0	24.8	11.5
14.....	K-1	48.1	59.0	61.3	64.7
15.....	I-2	38.3	41.4	68.1	58.0
16.....	E-1	21.0	26.9	8.6	12.4

SUMMARY OF DIFFERENCES*

	(1-2)	(3-4)	(1-3)	(2-4)	(1-4)	(2-3)
Aver. Diff.....	8.6	9.4	9.2	9.9	11.4	12.0
Largest Diff.....	24.5	17.6	29.8	27.0	23.9	26.8
Smallest Diff.....	2.4	2.0	0.3	0.4	0.1	0.2

* (1-2), (3-4), etc. refer to the differences in the columns numbered 1, 2, 3, and 4.

SECTION II

CORRECTIONS FOR CHANCE AND "GUESS" VS. "DO NOT GUESS"

INSTRUCTIONS IN MULTIPLE-RESPONSE TESTS

Historical.—In February, 1925, Ruch and Stoddard² published the results of two minor studies which seemed to show small but fairly definite losses in reliability when the method of scoring followed the conventional formula, $\text{Score} = R - (W/n - 1)$, instead of simply the "Rights." In one of these experiments the population used was inadequate (43). The second experiment used populations of about 135 for each determination reported. In both cases the number of times that the reliability was lowered by application of the correction formula greatly exceeded the number of rises in reliability. These two studies provided no data on either of two more important questions than reliability alone, viz., the effects of chance corrections on *validity*, and the relative merits of instructions to "Guess" or "Do Not Guess."

In December, 1925, Paterson and Langlie³ published results confirming those of the first-mentioned study and based upon more adequate populations.

During the past year, two independent investigations have been in progress along roughly similar lines, each attempting to validate or disprove the correction formula. Wood has just published⁴ his findings, and the present paper presents the results of DeGraff and Ruch.

Wood calls attention to the same issue raised by the present paper, viz., that *validity coefficients are raised by chance corrections, but reliability coefficients appear to be lowered*. The present investigations are in good agreement on this point, as will be shown by Tables I and II. The fact that Wood's test materials were from the fields of French and law and the subjects were college students makes the agreement with the present data on tests in history with elementary and high-school pupils all the more striking. The main difference between the experiments which Wood reports and the present studies lies in the fact that Wood dealt only with instruc-

² *Journal of Educational Psychology* (February, 1925), pp. 89-103.

³ *Journal of Applied Psychology* (December, 1925), pp. 339-48.

⁴ *Journal of Educational Psychology* (January, 1926), pp. 1-22. (To be continued.)

tions *not to guess*, while this paper presents comparisons of the effects of instructions *to guess* and *not to guess*; the rôle of chance corrections being studied for both types of instructions.

Materials and method of this study.—A total of 2,453 pupils were used in the present study, distributed as follows:

	Recall	7-R	5-R	3-R	2-R	True-False
"Guess"		233	236	246	223	239
"Do not guess"		229	274	229	281	263
Totals	2,453	462	510	475	504	502

Two hundred items covering the general field of United States history were selected carefully by analysis of several leading textbooks. These were broken into two forms, hereafter designated "Form A" and "Form B." The further treatment of these items was that of "translating" them into five different types: recall (completion), 7-response, 5-response, 3-response, 2-response, and true-false. The earlier paper cited (Ruch-Stoddard) describes the method of doing this. It seems necessary at this point to present the full list of tests in order to make the plan of experimentation clear. Eighteen test booklets of eight to twelve pages each were prepared as follows:⁵

	Items
1. Recall, Form A (Criterion)	100
2. Recall, Form B (Criterion)	100
3. 7-Response, Form A, "Do not guess" instructions	100
4. 7-Response, Form B, "Do not guess" instructions	100
5. 7-Response, Form A, "Guess"	100
6. 7-Response, Form B, "Guess"	100

All of the 2,453 pupils took Recall, Form A, on the day of the first test sitting. Recall, Form B, followed the next day. The third and last sitting provided for ten subgroups broken purely by chance. Each of these subgroups received one of the multiple-response test booklets (or a true-false booklet) with both Forms A and B printed under one cover. The test booklets were arranged prior to the third sitting in serial order so that when the teacher "dealt from the top of the deck" she automatically sifted the ten

⁵ The remaining twelve tests were built in pairs of four, exactly like the 7-Response tests, except that the items were constructed, successively, in 5-, 3-, 2-Response, and True-False forms.

kinds of booklets throughout her group in a chance fashion. The ten groups thus formed may be described as follows:

- 7-Response "Do not guess" group
- 7-Response "Guess" group
- 5-Response "Do not guess" group
- 5-Response "Guess" group
- 3-Response "Do not guess" group
- 3-Response "Guess" group
- 2-Response "Do not guess" group
- 2-Response "Guess" group
- True-False "Do not guess" group
- True-False "Guess" group

The data presented in Tables IV and V show how exactly these ten subgroups proved to be in ability.

Correlations of one of the multiple-choice tests with the criterion (Recall) are termed here "Validity Coefficients." The reliability coefficients are invariably the correlations of Forms A and B of the same test.

The items were the same 100 in all *A* forms throughout, and the same 100 in all *B* forms throughout, *as far as it is possible to assert that an item remains the same when changed successively from recall, to 5-response, to true-false, etc., form.*

The two different sets of instruction used are given below; the 5-response form being chosen as the example. The wording had to be changed slightly for the other multiple-choice forms to make the obvious adaptations necessary.

"DO NOT GUESS" INSTRUCTIONS

NOTE CAREFULLY: If you are in doubt about the answer to any question, leave it blank. *Do not guess!* You will be penalized for all wrong answers. The tests are scored in such a way that you will lose more than you will gain by guessing.

REMEMBER: Do not guess. Answer only those that you are reasonably sure about.

"GUESS" INSTRUCTIONS

NOTE CAREFULLY: Do not leave any questions unanswered. If you don't know, *guess*. It is better to guess than to leave a question blank because you have one chance in five of getting it right by pure guessing. You should try to make as logical or shrewd a guess as possible.

REMEMBER: Try to answer every question. *Guess if you do not know.*

TABLE III
VALIDITY COEFFICIENTS

RECALL Vs.	"GUESS"			"DO NOT GUESS"			DIFFERENCES			
	(1) Uncorr.	(2) Corr.	(3) Diff. (2-1)	(4) Uncorr.	(5) Corr.	(6) Diff. (5-4)	(4-1)	(4-2)	(5-1)	(5-2)
7-Response A.....	.871	.873	.002	.927	.926	— .001	.056	.054	.055	.053
7-Response B.....	.816	.861	.045	.872	.898	.026	.056	.011	.082	.037
5-Response A.....	.907	.910	.003	.891	.918	.027	— .016	— .019	.011	.008
5-Response B.....	.860	.903	.043	.836	.870	.034	— .024	— .067	.010	— .033
3-Response A.....	.838	.848	.010	.845	.915	.070	.007	— .003	.077	.067
3-Response B.....	.797	.875	.078	.852	.902	.050	.055	— .022	.105	.027
2-Response A.....	.859	.865	.006	.740	.775	.035	— .119	— .125	— .084	— .000
2-Response B.....	.735	.806	.071	.752	.868	.116	.017	— .054	.133	.062
True-False A.....	.804	.839	.035	.749	.860	.111	— .055	— .090	.056	.021
True-False B.....	.675	.801	.126	.768	.856	.088	.093	— .033	.181	.055
Mean <i>r</i>.....	.815	.858	.....	.823	.890	.....	.....	.....	.....	.....
Proportion of "significant" differences	.....	+	2:10	.....	.....	5:10	2:10	1:10	7:10	3:10
(underscored values) to total number	.....	—	0:10	.....	.....	0:10	1:10	3:10	1:10	1:10
of differences (10).....	.....	Both	2:10	.....	.....	5:10	3:10	4:10	8:10	4:10

TABLE IV*
RELIABILITY COEFFICIENTS

T _{TEST}	"GUESS"			"Do Not GUESS"			DIFFERENCES			
	(1) Uncorr.	(2) Corr.	(3) Diff. (2-1)	(4) Uncorr.	(5) Corr.	(6) Diff. (5-4)	(4-1)	(4-2)	(5-1)	(5-2)
Recall (.950)										
7-Response.....	.800	.839	.039	.886	.907	.021	.086	.047	.107	.066
5-Response.....	.864	.902	.038	.862	.882	.020	—	.040	.018	—
3-Response.....	.837	.858	.021	.886	.890	.004	.049	.028	.033	.032
2-Response.....	.745	.864	.119	.859	.843	—	.114	—	.098	—
True-False.....	.641	.780	.139	.885	.837	—	.241	.105	.196	.059
Mean <i>r</i>.....	.777	.849	.....	.876	.872	.....	.....	.....	.....	.....

* The italicized values show all differences which are 3.0 or more times their probable errors, and hence are probably "significant" differences.

TABLE V
CORRELATIONS OF RECALL (CRITERION) AND MULTIPLE-RESPONSE TESTS,
CORRECTED FOR ATTENUATION

	"GUESS" INSTRUCTIONS		"DO NOT GUESS" INSTRUCTIONS	
	Uncorrected for Chance	Corrected for Chance	Uncorrected for Chance	Corrected for Chance
7-Response.....	.967	.971	.980	.982
5-Response.....	.974	.975	.953	.976
3-Response.....	.916	.954	.925	.988
2-Response.....	.945	.921	.838	.917
True-False.....	.943	.953	.827	.962
Means.....	.949	.955	.905	.965

TABLE VI
MEAN SCORES

	RECALL A	MULTIPLE-RESPONSE A		RECALL B	MULTIPLE-RESPONSE B	
		Uncorr.	Corr.		Uncorr.	Corr.
7-Response (G)*.....	25.9	50.0	41.5	26.2	39.6	32.6
7-Response (N)†.....	27.6	44.9	40.0	27.6	37.2	33.1
5-Response (G).....	25.7	54.2	43.4	26.9	45.5	35.4
5-Response (N).....	28.0	48.8	42.3	28.6	42.1	36.4
3-Response (G).....	25.6	62.2	43.6	26.1	55.5	36.6
3-Response (N).....	27.4	54.1	41.9	27.5	48.2	36.1
2-Response (G).....	26.7	71.7	43.6	27.4	67.2	37.1
2-Response (N).....	33.4	65.1	45.8	33.3	60.3	40.2
True-False (G).....	27.4	65.8	32.3	26.8	61.3	26.0
True-False (N).....	27.5	51.0	30.8	27.6	47.6	26.8

* (G) means instructions to "Guess."

† (N) means instructions "Do not Guess."

SUMMARY AND CONCLUSIONS

1. When instructions are given to "guess," the chance correction formula raises the reliability. (Columns 1 and 2 of Table IV.)
2. When the subjects are instructed "not to guess," the chance correction appears to be of no value in increasing reliability. (Columns 4 and 5 of Table IV.)
3. As far as sheer reliability is concerned, it seems to be true that uncorrected "do not guess" instruction scores are best. (Columns 1, 2, 4, and 5 of Table IV.)
4. Instructing subjects to omit doubtful items rather than guessing seems to have some effectiveness. (Tables III-VI.)

5. Conclusions from the behavior of reliability coefficients alone are not defensible, since validity coefficients show different trends under corrections for chance. (Comparison of Tables III and IV.)

6. The observed order of decreasing validity for the four techniques studied was as follows:

Instructions not to guess and chance corrections.

Instructions to guess and chance corrections.

Instructions not to guess and without chance corrections.

Instructions to guess without chance corrections (Table II).

7. The practice of instructing pupils to guess appears to have no particular merit, and it does not insure a better "working out" of the formula for corrections for chance. (Columns 2 and 5 of Table III.)

8. Due to inconsistencies in the behaviors of the various determinations in Table III, it would seem wise to repeat such experiments many times with varied materials. However, it is not likely that totally unambiguous answers to the issues we have raised will be had unless total populations of at least 5,000 to 10,000 are used in order to reduce unreliabilities of differences. This argues that for most practical purposes the exact technique to be chosen is not a matter of tremendous importance. We can stand on reasonably safe ground, for the present, *to instruct pupils not to guess; leaving the matter of corrections of chance to the whim of the examiner*, the preference being for correction.

9. When the various tests are corrected to allow for attenuation due to errors of measurement, there is no evidence that the tests used differ greatly in the functions which they measure (Table V.)

10. The effect of correction for chance on the mean scores of true-false tests is markedly different from such corrections applied to multiple-choice tests proper (Table VI). Corrected true-false means proved to be about ten points lower than those of the 2-response arrangements of the "same" items. This agrees with the earlier findings of Ruch and Stoddard.

This point needs further study. The issue involved may prove to lie in the situation outlined below. In the case of the items:

- | | | | | | | | |
|--------------------------------------|---|---|---|---|---|-------------|--------------|
| 1. A famous southern general was Lee | . | . | . | . | . | <i>true</i> | <i>false</i> |
| 2. A famous southern general was | . | . | . | . | . | <i>Lee</i> | <i>Grant</i> |

If we assume total ignorance of the man, Lee, on the part of a pupil, it is obvious that the chances are 50:50 that he will succeed on Item 1. We can make the same assumption in the case of Item 2; but assume that the pupil knows that Grant was a northerner. His chances are, therefore, 100:0 of success. In the case of Item 2, he would have to be totally ignorant of *two* facts to have the situation resolve itself into a 50:50 break for success. The pupil's response in a genuine 2-response test may be made either upon the basis of knowledge that one thing is true or upon knowledge that the other thing is untrue. If pupils are "100 per cent informed" about both facts, or "100 per cent informed" about one fact and "100 per cent ignorant" about the other, they succeed on the test item in 2-response form. They succeed half the time if they are "100 per cent ignorant" about both facts.

The foregoing may or may not be the reason for the differences we have noted, but it is a tempting hypothesis.

SECTION III
MATCHING TESTS

TABLE VII

DATA ON THE RELATIVE MERITS OF PRESENTING GROUPS OF 5, 10, 15, 20,
AND 30 ITEMS IN MATCHING TESTS

TEST	GROUPING	AVERAGE FORM A	AVERAGE FORM B	r_{AB}	N
Dates and Events					
1.....	Items grouped by 5's (maximum difficulty)	13.3	10.8	.90	259
2.....	Items grouped by 5's (minimum difficulty)	23.8	21.8	.95	261
3.....	Items grouped by 10's	8.9	6.6	.84	245
4.....	Items grouped by 15's	8.3	6.3	.82	245
5.....	Items grouped by 20's	7.4	5.6	.85	252
6.....	Items grouped by 30's	7.5	5.3	.85	248
Men and Characterizing Phrases					
7.....	Items grouped by 5's	39.8	43.6	.94	309
8.....	Items grouped by 10's	31.1	34.1	.94	315
9.....	Items grouped by 15's	26.9	29.1	.91	314
10.....	Items grouped by 20's	24.3	24.1	.92	304
11.....	Items grouped by 30's	21.0	21.6	.91	306
Materials of Tests 7-11 Presented in Completion Form					
12.....	No grouping—a completion, not a matching, test	15.5	15.1	.91	314

III. TRAINING TEACHERS TO UTILIZE COMMUNITY RESOURCES AS CURRICULUM MATERIAL

E. D. Grizzell

An important problem in the field of education is training teachers to utilize community resources as curriculum materials. Our use of "training" implies practice in doing. "Community" is used to include not only the local community but any community to which the teacher and the school have access. By "curriculum materials" we mean anything representing experiences having value in the development of children.

If our schools are to serve the primary function of supplementing and completing the process of education to which all other institutions of society are making important contributions in less formal ways, certainly the school must know precisely what contributions other institutions and agencies are making to each individual's development. If particular elements of this education are being provided well enough, or at least as well as or better than the school can provide them, the school's task is to co-operate with those institutions and agencies to make sure that all individuals requiring those elements of education shall receive them.

If the school observes that certain elements of education hitherto provided sufficiently well by other institutions and agencies are, because of current social and economic changes, being slighted or neglected, then the school must give immediate and direct attention to these matters. But under no circumstances should the school assume to take the place of other agencies when for any reason the educational service rendered would be lessened in value by being made a part of the formal educational program of the school.

But how can the school preserve such a balance and discriminate so nicely in the performance of its functions? The only possible answer is by constant, intelligent contact with the community it serves. The school must strive to articulate the school life of the child with the community life of the child.

A large part of one's life must be spent in the shadow of many institutions and agencies ready to serve when need arises. Libraries, laboratories, research bureaus, social centers, museums, art galleries, musical activities, and many more represent the varied opportunities for useful experiences. Every community provides some such opportunities, and these may be supplemented to almost any extent by the contributions of agencies of regional and national scope.

The need for training teachers to utilize these latent resources arises because of a number of limitations.

1. The traditional conception of education as mental discipline is still with us in our classroom practice. Education means for many teachers "book learning" rather than the development of human beings with socially efficient personalities.

2. The traditional conception of the curriculum in terms of subject matter to be found in predigested form in textbooks is still dominant in American education. A recognition of the child's personal experience in terms of his own activities has not been achieved in curriculum-making.

3. There is a lack of knowledge on the part of teachers and administrators of the true resources of the community—resources readily available as curriculum content. Resources in other communities easily accessible are not known to exist.

4. In most communities the various agencies have not learned to co-operate in education. Agencies having excellent facilities for educational purposes refuse to co-operate at all.

5. In many cases co-operation is a disguise for advertising. Teachers and school administrators must not mistake propaganda for truth. The educational work of community agencies is frequently rendered valueless on account of the emphasis placed on advertising and questionable propaganda.

6. The inefficiencies of the personnel in charge of the educational work of community agencies are often a serious handicap. This limitation can be overcome with proper assistance from the school itself, but it requires tactfulness and patience.

7. The size, character, and location of the community is a natural condition and frequently a serious limitation over which teach-

ers have no control. However, it is a poor community indeed that cannot contribute something worth while of an educational nature. Furthermore, it is possible and very desirable to utilize other resources in other larger and more favored communities. This is one step in the equalization of educational opportunity.

This list of limitations is a formidable one, but they are not insurmountable. In fact, the fundamental ones are due largely to a lack of training, much of which might well be given to teachers in service if not possible during their period of preparation.

An analysis of the limitations suggested indicates at once the need for a better understanding of fundamentals in educational philosophy. There is also a need for definite training in the technique of curriculum-making, with special emphasis on the construction of the social curriculum. With these fundamental considerations taken care of, the several other limitations are either eliminated automatically or their influence reduced to a negligible quantity through the increased effectiveness of the school as a co-ordinating agency.

The unit of training proposed is logically a part of the training in curriculum construction. The general plan suggested represents our tentative conclusions after three years of experimentation with six groups of students, the groups varying in size from 60 to 140 students. The groups consisted of Sophomores, Juniors, and Seniors, the larger number being Sophomores. A small percentage of each group were teachers with experience. All had completed at least one course in education.

The main purposes are:

1. To train the teacher to discover the institutions and agencies of a given community and those in other or larger communities whose resources may be utilized in curriculum-making in elementary and secondary schools.
2. To develop in the teacher the ability to analyze and utilize in curriculum-making the existing elements of educational programs and other features of the institutions and agencies studied.
3. To train the teacher to discover causes of failure or of weakness on the part of the school and other agencies in utilizing community resources for educational purposes, and to propose remedial measures.

These several objectives indicate that the training proposed is planned specifically to remove the several limitations set forth above.

The content or scope of the training involves:

1. A general investigation of institutions and agencies, without regard to location, that provide opportunities for educational experience. In this investigation chief attention is given to institutions and agencies other than schools, except possibly schools of a highly specialized character. The nature of the educational resources, both materials and activities, and the procedures employed, as well as other significant details of organization and management are carefully noted when the sources of information provide them.

2. A survey is made of local and regional institutions and agencies accessible to the class or training group. This survey or series of field studies covers the same scope as the larger preliminary investigation.

3. The results of the preliminary investigation and local survey are analyzed in detail.

4. Supplementary to, and closely related to the latter phase of the work is the utilization of the resources discovered and analyzed as definite elements of the curriculum. The degree to which this part of the work can be emphasized is dependent largely upon the character of the class or training group.

The following schedule suggests the general scope of the field work carried on at the University of Pennsylvania:

OBSERVATION SCHEDULE, 1925-26, TERM II¹
(SUBJECT TO CHANGE)

NOTE.—Each observation must be made according to schedule. It is impossible for individual students to make up any of the observations.

1. February 8, 10: Introduction. General investigation of institutions and agencies contributing to Education.
2. February 15-26: Libraries. Children's Department of Philadelphia Free Public Library,* Library of Historical Society of Pennsylvania, etc.
3. March 1-12: Museums. Academy of Natural Science,* Commercial Museum,* University Museum,* Academy of Fine Arts, Pennsylvania Museum (Fairmount Park), etc.

¹ Observation of places marked by star (*) required of all students.

4. March 15, 17: Research and service agencies.* White-Williams Foundation, Bureau of Municipal Research (lectures).
5. March 25-27: Professional associations.* Schoolmen's Week, University of Pennsylvania. Attend one or more sessions. Observe as much of the work as time will permit.
6. April 12-16: Special educational agencies. Graphic Sketch Club,* Settlement Music School, Y.W.C.A. (Life-Saving Class), Scouting, Summer Camps.
7. April 19-23: Settlement Houses.* Neighborhood Center and University House (one required).
8. April 26-30: Industrial plants.* Abbott's Dairies (milk and ice cream plants), Bell Telephone Company, Ford Motor Company, Public Ledger, Stetson Hat Factory, Philadelphia Electric Company, etc. (one required).
9. May 3-14: Auxiliary agencies. Philadelphia Interstate Dairy Council, demonstration by nutrition and dramatic departments,* Chamber of Commerce, Broadcasting Station (lectures and observations).
10. May 17-21: Recreation centers.* Funfield, Kensington, Kingsessing, Shot Tower, and Starr Garden recreation centers (one required).

The procedure employed is of three distinct types:

1. The general investigation is made by compiling lists of institutions and agencies. The information is obtained from directories, annual reports, government bulletins, books and magazine articles dealing with various types of agencies, and from the general experience of members of the class or training group. These lists are analyzed and the various items tabulated for general use. This preliminary study serves as a guide in the survey of local resources.

2. The local survey is the most important part of the work and requires a great amount of time. The details involved in scheduling group observations in connection with the various agencies to be studied require considerable time and attention on the part of the director of the work. Observation and study of agencies under normal conditions require the full co-operation of the management of the agencies and the personnel in charge of the activities to be observed. Extreme care must be taken to avoid specially staged programs planned for propaganda purposes. Keeping a large group

of teachers or members of a training group on schedule over a period of several weeks of continuous field work is a difficult problem, but is absolutely necessary when working with institutions and agencies whose primary purpose is production of material things according to fixed schedules, or service to the public in other well-defined fields. Any variation of an exceptional character tends to upset their regular machinery unless carefully planned and scheduled.

3. The analysis and evaluation of the available resources are carried on in connection with the survey by means of individual reports or studies and group discussions. Along with the analysis and evaluation of the results of the survey consideration is given to the technique of curriculum construction and the practical uses to be made of the resources available. The nature of the training group and the experience and maturity of the various members will determine the character of the work in curriculum-making. The ideal procedure now being formulated by experts on curriculum-making is too difficult for inexperienced undergraduates in schools of education. Such procedure is possible with professionally trained teachers of experience in graduate classes or in local teacher-training groups wishing to utilize their own community resources. However, undergraduate students can make a very respectable beginning in the analysis and evaluation of materials with reference to their contributions to the generally accepted objectives in secondary education as well as to the content of the several formal school subjects.

A typical procedure at this point is the charting of the materials and activities discovered under the several headings of (1) institutions and agencies, (2) their educational contributions: materials, activities, procedures, etc., (3) educational objectives to which they contribute, (4) formal school subjects to which they contribute, (5) suggestions as to relative values, standards, etc.

Relative values and usefulness of the elements are indicated when possible. The analysis involves also a consideration of the various special procedures and devices employed, such as collections of demonstration materials, special exhibits, lantern slides, moving pictures, posters, charts, chalk talks, gallery talks in mu-

seums, educational dramatics, observation tours, etc. Special emphasis is laid on the necessity for elimination of propaganda and advertising. The programs of some institutions are included in the local survey with this particular purpose in mind.

The following suggestions relative to outcomes of the training described represent the writer's conclusions after three years of experimentation: (1) A definite knowledge of community resources available as curriculum materials is obtained. (2) A greater interest in community life and community needs is aroused, which results usually in a better understanding between the school and other community institutions and agencies. (3) Higher ideals of service on the part of the school as a social institution are developed. (4) The principle of co-operation of all the institutions and agencies of the community for the common welfare becomes fairly definitely fixed in the minds of the students and the representatives of the institutions and agencies observed. (5) A broader conception of aims and values in education is developed in the minds of the students. (6) A knowledge of, and some skill in, the technique of curriculum-making are acquired.

The strong points of such training are obvious where it is possible to provide for a varied field-work program. The limitations vary according to local conditions. A training course of the kind proposed is easily provided in any reasonably large population center. The opportunities for observation and field work would be considerably curtailed in a small community. However, the smallest community is not too small to serve in demonstrating the local survey. In a small community more time would be needed in investigating opportunities available in other communities and in utilizing regional and national resources.

A serious difficulty arising in connection with the administration of such a training course is the unusual amount of time required of both students and director of the work. It is particularly difficult in the case of undergraduate students. They need a large amount of guidance in the field work. This matter has been handled with some degree of success at the University of Pennsylvania by organizing small observation groups and placing a responsible student with some experience and knowledge of the city in charge

of each group. The director of the work divides his time among the various groups and is able in that way to check up on the field work.

The next step in the development of this phase of teacher training is the provision of a better technique for a community educational survey which may be used by either the individual teacher or groups of teachers. Present methods of observation are inadequate and inefficient. We need to test the results of the training described as shown in the work of the teachers who have received the training. Finally, there is need for careful experimentation with the new type of curriculum to see whether the utilization of community resources as curriculum materials is justified by results.

IV. A TRANSPLANTED AMERICAN EDUCATIONAL ADMINISTRATION: THE PHILIPPINE SCHOOL SYSTEM

Carter Alexander

VALUE OF THE PHILIPPINE EDUCATIONAL SYSTEM FOR AMERICANS

That one of the boldest adventures in all human enlightenment, that tremendous missionary enterprise known as the Philippine school system, has important suggestions for American educators. The islands afford probably the best existing test of the applicability of American ideals and principles of educational administration outside of continental United States. Differing radically in background, the Philippine situation has been a far more difficult one in which to set up a successful school system after the American pattern that obtains in any of our states. Thus Philippine successes and failures are of unusual interest to American students of educational administration.

THE PHILIPPINE EDUCATIONAL PROBLEM IN 1898

The educational problem of the Americans in the Philippines was from the beginning only one phase of the general Philippine problem. This latter problem was how to prepare the Filipinos for two possibilities—either for some kind of permanent governmental relation to the Americans, the nature of which no one could then foresee, or for existence as an independent nation friendly to the States. Each possibility demanded the inculcation of American ideals and culture. To Americans such inculcation was inconceivable except through some kind of a public school system. As the Americans were without colonial experience, the obvious way to secure a Philippine school system was to transplant their own educational administration. But to understand the difficulties involved in any such transplanting one must have clearly in mind just how the two countries differed in the determining conditions for any kind of public education.

Of the Philippine setting in 1898 the American educators were completely ignorant. Otherwise they could not have had the faith,

courage, and idealism necessary for their undertaking. Geographically, economically, racially, and institutionally the situation was entirely outside their previous experience.

Geographically, the Philippines consist of over 7,000 tropical islands of approximately the area of New England and New York combined, but spread out over an area roughly equal to that of the Mississippi Valley. They thus had climatic differences and difficulties of communication, with resulting delays and hardships in attempts to secure uniformity in a school system, far beyond anything then conceivable in any of our states. Think, for instance, of financing education where one province is liable to have every school building blown down in a few hours, as compared with provinces that never lose a building this way. Or take the problem of how a province which has rain every day in the year can compete in a national athletic program with neighboring provinces having long dry seasons. The islands had had no occasion for direct contacts with the States, and it took longer for communication by letter than between the American colonies and England at the time of the Revolution. This remoteness meant that only the youngest, hardiest, and most daring educators could be expected to go from the States, and once in the islands they must depend almost wholly on their own resources for professional inspiration and equipment.

Economically, the Philippines and the states were unlike in important respects. Both countries had relatively sparse populations, with agriculture as the basis of subsistence. But the Philippines were poverty-stricken beyond anything even in our impoverished South, which had, up to then, been unable to finance more than the beginnings of public education. As the Philippine agriculture was a tropical one, our people were unprepared to stimulate it so as quickly to create new wealth, without which any public school system could not be supported. Furthermore, agriculture will be the basic Philippine source of wealth for generations, whereas our country was rapidly becoming industrialized, and hence increasing its wealth for public school support far faster than any agricultural country, particularly a backward country, could possibly do.

Racially, the Filipinos are 90 per cent Malay, with remnants

of Negrito and infiltrations of Japanese and Chinese blood, having maturity ages, customs, habits, educational needs, and educational capacities about which our educators knew nothing. The cultural and institutional differences of these stocks from ours were as wide as the Pacific.

For Americans, accustomed to one language which enabled a Portland, Maine, man and his family to discuss fluently with a Portland, Oregon, man and his family, games, food, clothes, schools, or government and politics, the Philippine language difficulties were almost incomprehensible. The official Spanish language was not understood or read by over 5 per cent of the Filipinos. They still have over eighty distinct dialects, the most important six or eight of which differ from one another as much as do the languages of Europe. This diversity of language raised one of the most difficult problems connected with the Philippine educational system. What is the best medium of instruction in the various grades of schools?

In addition to language differences, there were wide divergences in other cultural and institutional matters. Religious differences were marked and bitter. The government, from Spanish influence, was centralized to a degree unknown in the States except in time of war, and then only in areas under military occupation. Instead of local boards or governments elected by the people, local affairs in the Philippine community had been mainly administered by the *cacique*. This individual was a kind of tribal chief and political boss combined. Not elected or obtaining his position by inheritance, but rather by his individual merits, he exerted great power over the opinions, property, life, and condition of servitude of his community. This permitted great directness of action when his influence could be secured or bought, but it did not develop the local initiative upon which our whole governmental theory and practice then rested.

In one respect the educators from the States were fortunate. There was no great school system to be made over, no thousands of teachers who would for years and years go on teaching as they had learned in youth. There was little interest in schools, and no attempt worthy of the name to have elementary schools for all the

masses. A few such schools did exist, but they were negligible. Secondary schools had been established to prepare young men of Spanish blood for the universities in Spain and, later, for the church schools in the Philippines. Later, chiefly through a university established even before Harvard, higher education was extended to bright Filipino boys. The tiny educational system was intended to keep the Spaniards and the clergy in the saddle. Just before the Americans came, a revolution had ousted the church from its great power in government. There was thus really no government or institutional backing for education. The islands were virgin soil awaiting the American educational plows.

CHARACTERISTICS OF EDUCATIONAL ADMINISTRATION IN THE UNITED STATES IN 1898

To this unknown Philippine situation came the Americans, accustomed to a state administration of public education which had six outstanding characteristics:

1. *A popular faith in public education.*—Free education in tax-supported schools was almost a kind of national religion. Its basis was a faith that such schools were necessary for the continuance of the Republic and for giving individuals equal opportunities in life.

2. *Free public education limited in extent and accessibility.*—The practice lagged considerably behind the faith in public education. Elementary schooling was free in all states, but length of terms varied greatly. Not all states had compulsory education laws and there were great variations in enforcement. Practically all states had free secondary and higher schools, but there was wide variation in provision for such education in different sections. Secondary and higher education was predominantly private.

3. *Decentralization of administration.*—While education was theoretically a state function, in practice local authorities paid little attention to state departments of education. The latter, staffed chiefly with men selected for political reasons, confined themselves usually to the mechanics of state aid, building safety, uniform texts, notes on courses of study, feeble attempts at raising certificate requirements, and the like.

4. *An inadequately schooled personnel almost wholly without*

professional training.—This was several years before the North-Central Association required high-school teachers in its accredited schools to be college graduates; fourteen years before Missouri required every teacher to have at least the equivalent of one year of high-school work; and about that long before all our southern states had state normals. While there were teacher-training institutions, only the wisdom of local authorities secured any trained elementary teachers, and then only in the cities. There was practically no professional training in colleges or universities for high-school teachers or administrators. State and county superintendents were generally secured by popular election, with practically no reference to academic or professional preparation.

5. *Little professional leadership exerted by administrators.*—Whatever professional leadership existed was exerted by individuals, often in higher institutions, like the University of Chicago, which was starting its epoch-making work with the North-Central Association, or like Teachers College, which had just called Dean Russell. Teachers' associations sometimes made feeble efforts, but superintendents had little class consciousness and exerted small professional leadership. Tenure of office was almost unknown. There was no real profession of teaching or of administration.

6. *Political interference with educational administration beginning to wane.*—While such interference was still active in many places, both theory and a growing practice tended to have the state government determine the form, minimum courses of study, certificate requirements, and limits of support for local school systems, leaving the local school board and its executive free to run matters thereafter as they deemed wise.

THE INTRODUCTION OF THE SYSTEM

Into the alien Philippine setting the Americans burst with their inborn faith in the necessity of public schools for the welfare of any people, and in the rights of all children for an equal opportunity at getting an education. They thought and talked much about "the little brown brothers," and characteristically planned for the schooling of these brothers as they would have planned at home for their own relatives and for their neighbors' children. They fairly burned

to set up an American educational system at once. It was the only kind of a school system they understood. With all the drive and missionary spirit for which they are noted the world over, they started this gigantic pioneer undertaking. But they soon discovered they had to make material changes.

The American military forces began opening schools before their guns had cooled. Any soldier who had ever taught, and many who had not been teachers, were encouraged to work with schools. From these soldier teachers many of the early school administrators were selected. The work was soon taken over by the civil government, but in the early days there was no sharp differentiation between the military and civil organizations, especially in remote and dangerous areas. The military authorities naturally tended to make the educational organization highly centralized and to operate it with that superfluity of paper work and reporting for which all military organizations are noted. The civil government at the outset grew from Manila, and easily enough, particularly with a people accustomed to much centralization, took that policy for granted. It could not have been otherwise.

A school system of four primary grades, three elementary grades, and four high-school grades was rapidly outlined, and schools opened wherever possible. This system, probably modeled after the schools in our southern states, was later topped with a university at Manila and rounded out with normal, agricultural, and industrial schools, and the like. But it was always directed and controlled from Manila.

Perforce the American personnel in this school system at first operated just about as it would operate in the States. American texts soon set the Filipino children of the tropics to memorizing Whittier's "Snow Bound." American geographies were shipped over, and the children set to learning about their country with the same maps and reading matter originally intended to give American children the fragments about the Philippines which their geographies then carried. The methods were the methods used in American normal schools for students who had learned English in babyhood, or in the regular public schools and liberal colleges which had given some of the teachers their only training. One early high

educational official energetically shipped out thousands of desks, in complete ignorance of the fact that Filipino schoolhouses had only dirt or bamboo-strip floors, to neither of which could a desk possibly be screwed. Wood-working and machine shops were installed when whole communities and teachers were so ignorant of machinery that the Manila headquarters had to keep mechanics constantly traveling in order to keep the shop machinery in running order. Industrial arts and agriculture were started for boys in a social situation where a boy of the select class getting any schooling at all was rather expected to have another boy carry his books to school for him. Needlework, weaving, basketry, and other forms of manual work were started when there was no local demand for the products, no funds for buying supplies for such work, and a system of selling the product in the United States had to be built in order that children might be enticed by the hope of earning to take the work, and that money for supplies might be procured.

As the islands were poverty-stricken and public opinion would not sanction grants of American taxes for the educational system, this system had to be financed from Philippine revenue, necessarily on a very meager scale. This, of course, meant largely with national or insular aid from Manila. The populace was so eager for education that it put forth tremendous local efforts for school buildings, teachers, and supplies. A *cacique* determined to have a school for his community could always raise revenues, by ordering his people to make "voluntary" contributions, as effectively and as universally as could any local tax system. The strong centralization made it possible to secure high salaries for the central staff and provincial administrators, and many good men were secured for this purpose. The centralized system could transfer, protect, and advance American teachers far beyond what any state system in this country could do in such matters.

The Americans were unprepared to conduct schools in any language save their own. No one knew whether the islands would remain with the United States or not, but it was of course assumed that the two countries would desire to be friendly under any conditions. In either event it was desirable, from the American standpoint, to have the Filipinos understand English. Furthermore, as

the Filipinos had no general means of communication, except Spanish among the élite, English was put forward as a means to national unity much as José Rizal was put forward as a national hero for them. To quicken their progress toward a real nation both things were highly desirable. Since English is about as far from the Filipino dialects as any language on earth, the only hope of securing teachers who could use it was by importation on a large scale from the States. This meant an American teaching personnel, recruited by the government, flowing steadily out from Manila. As most Americans at the time of Dewey's victory did not even know where the islands were, this American personnel could bring little more than a taste for adventure and such educational qualifications as persons with that taste might happen to have. Some of the early educators were men of the highest caliber; Dr. David Barrows, recently president of the University of California, and Professor Bobbitt, of the University of Chicago, for examples. The American government wisely established a generous salary schedule and transportation allowances which attracted capable men beyond what the mere desire to see the Orient could have achieved.

The Filipinos more than welcomed the schools. In general the people were so eager for education that they crowded in in far greater numbers than could possibly be accommodated even with classes double the size of those in the states. Huge numbers of adults started in the primary grades. The kind of work offered mattered nothing to them. They took cheerfully what was given. But it was a Herculean task to provide new buildings and teachers fast enough to teach the throngs pouring into any kind of school that could be opened. The central administration had its hands full in merely extending the system and keeping it operating at all. Whatever improvement was made in subject matter or methods of teaching was in a sense almost a gratuity from that administration, so great were the demands of the merely physical matters. But that administration went far beyond these things.

The central administration operated on the same basis of faith in popular education as did the American state school systems. This was easy because of the great enthusiasm of the Filipinos for schools. But it was exceedingly difficult to achieve anything like

equality of opportunity. Primary schools were free, but tuition for partial support was found necessary in the other schools. With such a paucity of schools, compulsory education was out of the question. But one great advantage over American administration was achieved from the start; all schools opened ran for ten months, so there was equality of terms. Equality of opportunity in whatever schools were opened was furthered also by uniform courses of study, texts, supplies—all furnished from Manila. The provision for secondary education was wisely limited to one high school in each province, with none of the questionable duplication of secondary schools found in many regions with us.

The central staff at Manila contained by far the best educators in the system. It had salaries requisite for securing such talent, both as regards competition with the United States and with the field in the Philippines. It did truly remarkable work in such things as designing standard school buildings of various sizes, inaugurating work in domestic science and arts, industrial arts, agriculture, and school gardening, laying out an elaborate plan of physical education and athletics. Probably no American state department of education did so much constructive pioneer work in these fields, employed the services of specialists when necessary, or had a headquarters staff so much superior in ability to the field as was the case with the Philippine central staff for a dozen years.

The teaching personnel was largely untrained and very inadequately schooled. This was inevitable in a system expanding so rapidly. But they had superior superintendents and supervisors. In fact, those leaders were in all probability relatively far superior to their teachers than was the case in any American state at that time. A central normal school at Manila and teacher-training departments in high schools were established. A summer school at Baguio, in the mountains of the largest island, was developed on a large scale, with special provisions for enabling students to go there cheaply. The expenses of administrators to this meeting were paid. An elaborate system of sending capable Filipinos at government expense to the States for training for teachers and administrators was installed. An extensive pension system was put into operation. In particular, Americans with education, and, later, professional equipment far above anything available in the islands

were imported in large numbers. At one time there were about twelve hundred in the system, all working under a plan which sent them back periodically to the States at government expense for further training and recuperation. No American state even approached any such plan for drawing superior ability and preparation from other states or for sending out its personnel to secure the best training available anywhere.

School administrators exerted real professional leadership, and education was a real profession. While the system was highly centralized, the very newness of the work and the difficulties of communication with Manila gave a local administrator a power and freedom such as probably no county superintendents of schools in the United States then enjoyed. In the centralized system an American had only to make good with the higher authorities and he could be quickly transferred or promoted at any time without regard to the influence of local politics on his progress. The same was true of Filipino educators, except that it was not then generally expected that they would be promoted to the highest positions so long as the Americans stayed in the islands. Administration was truly a life-career for an American schoolman in the Philippines in those days.

Educational administration was remarkably free from any political interference. The Filipinos were only too glad to have schools on any terms. They had not then reached the stage of political development and aggressiveness where they would try to control schools or to hamstring the Americans operating the system. The whole educational administration was then working on the basis of the general government's appointing the head educational officials and providing funds for schools, but thereafter keeping its hands off the schools.

The whole early period was in many respects comparable with the awakening in Massachusetts under Horace Mann. It was a period of great enthusiasm, great men, great undertakings, great accomplishments.

THE PRESENT STATUS

Over twenty-five years have passed, some of them so fruitful as to constitute a true golden age in education for the country. But political conditions have so changed that for the educational ad-

ministration the present period is a cold gray dawn of the morning after. The administration is now subject to pressures from both American and Filipino partisans in positions of influence. This made the personnel of the system desirous of evaluating by outsiders. Both American and Filipino groups wishing to influence the system concluded that such evaluation was necessary. All three forces thus strove for the Philippine Educational Survey, on which the writer served as staff specialist for administration and finance. The results of that survey, now available in a volume of nearly seven hundred pages,¹ enable us to see the present development of the American educational administration transplanted over a quarter of a century ago.

To one of the earliest American schoolmen going to the Philippines, the present educational system can, on the material side, hardly seem less than a miracle. It enrolls over 1,250,000 in the schools below college grade, has a secondary school enrolment equal to the population of Nevada, and embraces a university fairly comparable in buildings, faculty, enrolment, and results with many of our state universities. The teaching personnel numbers over twenty-seven thousand. The people are devoted to the cause of education, and there is probably no country on earth where a teacher or a school administrator ranks higher in public esteem and public recognition. A large central staff and hundreds of local administrators direct operations in thousands of concrete buildings that for substantial construction, distinctiveness, architectural adaptation, and beautiful appearance stand out in their communities as do the school buildings in our best American communities. But the whole administration is falling so far short of what it once did, and especially of what it once promised to do, that we may with profit review it carefully in terms of the characteristics of our administration at the time of transplanting.

Popular faith in education is greater than ever. The people generally regard secondary education as an escape from agriculture into the professions or government service. As a result, individuals are seeking academic secondary education at a rate to cause serious

¹ *A Survey of the Educational System of the Philippine Islands*. Published by the Philippine government. Purchasable from Bureau of Publications, Teachers College, Columbia University, New York.

alarm in all thoughtful observers. This rush to high schools is actually turning out proportionately three times as many high-school graduates prepared only for professions or government service as the United States or any great European country finds necessary. This makes the financial support of such secondary education very difficult. The situation is all the worse since very few secondary schools do anything of value to stimulate the creation of agricultural wealth necessary for the support of more or better schools.

In extent and accessibility public education is limited far beyond our realization. All schools opened run for ten months. But only a third of the children of suitable ages for the earlier grades are in school. In many communities they are not allowed to enter until the older children are cared for. The huge enrolments are made up of over-age pupils and adults. On the average, the Filipino boy or girl getting any schooling at all does not complete more than the first two grades. This, in view of the fact that the school work is in English, while the child knows only a dialect at home, means a sheer waste. The child does not stay in school long enough to learn English, much less to get any schooling through that foreign language. High schools are available to the extent of only one for a province, with the result that numbers of them are as large as our state universities, with students crowding in in such numbers that they can rent only sleeping space on the floors of dwellings.

The centralization which was so effective in the early years is now a shining example of what can happen in a country where such an administration is not checked up by an intelligent public opinion. Owing to financial difficulties and political pressures growing out of the Filipinization of the public service generally, the central staff no longer has a personnel vastly superior to the field. It can no longer exert the professional leadership it once exerted. It has become a huge machine doing the kind of work that a machine can do. It insures accuracy of accounting for funds and property. It handles the details of recording and reporting. It regulates the conduct of field administrators rather minutely, even forbidding them to leave their provinces without official permission. It makes out uniform courses of study, and sends out numerous circulars of official directions on the minutiae of administration. It rigidly en-

forces a general governmental regulation, not originally intended for education, that no official can publish anything without the consent of the head of his department. The result is that no schoolman in the Philippines can publish professional articles in the islands. The only way he can publish is to do so in the United States, with the hope that his article may reach the islands through scattered copies of the periodical or through reprints, at best a most imperfect method of distributing knowledge, inspiration, or criticism. Thus the islands are left without adequate professional leadership in the central staff, and the prohibition on publication means that there is no possibility of private professional leadership developing, as in this country. Think what it would mean in the United States for education if no city superintendent and no worker in a public school could publish a professional article. We should then be limited to what our state departments were doing on professional advancement, which in many states would be pitiful or even ludicrous.

The teaching personnel is inevitably very inadequately schooled and almost wholly untrained professionally. Only 15 per cent has had as much as high-school graduation, and only 5 per cent, any normal course or work above high school. Fifty per cent have had only about as much as the completion of our eight grades. The situation is all the worse considering the fact that many of these teachers have been taught by teachers who did not know how to use English. That is, thousands of the teachers with this limited education must teach in English when they have never been in contact with people who could use English properly. Aside from this language difficulty, the situation might not be so serious if there were an administrative and supervisory corps with true professional leadership. In the United States, where we have adequate supervision, we accomplish a great deal with teachers no better trained, relatively. But they do not have such supervision in the Philippines; there is little professional leadership in the central staff to secure it, and the official prohibition on professional publication insures that it will not develop through individual initiative.

In all mechanical matters such as transferring, promoting, and training men in service the system operates as perfectly as ever. Education is a life-career for any Filipino who wishes to continue

in the service, and for any American who cares to stay at the meager compensation to which he can look forward. But professionally it is a career in an educational graveyard.

As regards political interference with school administration in professional matters, the Philippines are going directly opposite to all our experience and wisdom. As has been indicated, the educational administration has developed into a huge organization. Naturally, in view of the controversies over the independence of the islands, both the American and Filipino governments wish to control the policies of this organization, which, in practice, means its administration. Because of the highly uncertain and delicate political situation regarding the degree, method of attainment, and date of independence of the islands, this control is naturally exerted in the ways familiar to politicians. Because the administration is highly centralized, this political control is rather easily exerted, and the same time most insidious and deleterious in its effects. This increasing political influence on educational administration may be inevitable because of the general political situation. Certainly this influence and its increase constitute the outstanding problem of the present Philippine school system.

To get the full meaning of this problem one must know that the American government has deliberately retained the headship of the educational system while giving over matters almost wholly to the Filipinos in most other fields. The head of the system is the vice-governor, appointed by the president of the United States, serving as secretary of Public Instruction. He has final responsibility for the shaping of educational policies, and in addition to being in a position to exert great influence in the Bureau of Education, which comprises all education and personnel below the university, has charge of private schools which exert considerable influence. He also is chairman of the university regents. Naturally he is appointed primarily for political reasons and for his general administrative abilities, and tends to change with the political administration of the States.

The Bureau of Education has an army line organization headed by the director of education. He is appointed by the American governor-general with the approval of the Filipino senate, an arrange-

ment which obviously may or may not secure a director who will work harmoniously with the secretary of Public Instruction. As all revenues for education come from Philippine sources, this director must be acceptable to the Philippine legislature, and consequently must come from the Philippines. So far only Americans have been appointed to the directorship. In the course of time it seems inevitable that a Filipino will be appointed, since the approval of the senate is required and it can be only a comparatively short while until there will be no Americans in the school system big enough to fill the position.

The Filipinos have worked out several devices for bringing pressure to bear on the director, and several others for taking professional matters out of his hands. Of pressure devices, the following are important. Forty per cent of his salary depends upon an annual contract subject to the approval of the Filipino Council of State. In two different years, and for two different directors, the contracts were not renewed until March, although the year started in January. For fear that the second assistant director would be an American, the position was abolished by the legislature. The director is accordingly compelled to have for this an assistant to the director, who must do the work of an assistant director without the latter's prestige and influence for pushing the work. The funds for the central office have been pared until the annual appropriations are lower than they were a dozen years ago, although the teaching personnel, pupils' expenditures, and the like have increased several fold, and the money itself will purchase much less. This leaves the director dependent upon Filipinos who can be secured at much lower salaries, and tends to the more rapid Filipinization of the staff, the end intended.

Two devices for removing professional matters from the control of the director of education are typical of the present attitude of the Filipino legislature. The building leadership formerly exerted by the Bureau is no longer possible for lack of funds. The insular building aid, formerly apportioned by the Bureau, has been taken out of its hands and is now allotted by the legislature about as post-offices were apportioned in our own palmiest pork-barrel days. The selection of texts has been taken out of the hands of the

director and placed in those of a board of five, of which he is a member. The other members are Filipinos, two of them from the legislature. A prominent Filipino legislator said this was done because the legislators were not satisfied with the history texts in use. As this change occurred when the government was spending half a million dollars annually for propaganda against the United States government, the situation is highly significant.

The influence of politics is also seen in the agitation against the use of English and in the salary and pension regulations. Because of the agitation for independence and the growth in Filipino national consciousness, there have been strenuous attempts to have the primary schools conducted in the dialects, or to have one dialect substituted generally for English. There is not, and never can be, enough instructional material for the former course, and no apparent possibility of the latter. But still the agitation continues, with its resulting troubles, intensified by the great drop in Americans from over a thousand to about three hundred and twenty-five now. What the country needs above most things is a uniformly good English, all through the islands, for a common language. This cannot be secured save as the present few Americans are concentrated in the training schools for teachers. But the population would probably rebel if the Americans were taken from the high schools, where most of them now teach. The politicians would accordingly oppose this strengthening of the training schools, while at the same time agitating for the dialects.

The salary and pension regulations have been deliberately drawn up to run Americans out of the system. Under a general statute all salaries of \$1,500 or over, which includes all high-school teachers and administrative officials and promotions for such personnel, must be approved by the Council of State. This tends to keep salaries at a level attractive to Filipinos, but at one which will not attract new Americans of ability and experience combined or retain more than a few Americans who can possibly get along elsewhere. The pension system has a special law to expedite the retirement of Americans by giving them rather liberal pensions and bonuses if they retire at once, with the implication that they may get much less or nothing if they hang on too long.

Many similar illustrations could be cited to show how the political elements are interfering with the educational system on professional matters, but they do not seem necessary.

The whole Philippine educational situation now seems almost hopeless in comparison with that of the United States, although the Philippine central educational administration is no worse than some of our state departments of education. The chief reason for this difference is that we have a great professional development of individual educators and a constantly improving public opinion that march steadily forward in spite of backward state departments, and ultimately force these departments to improve, or at least to get out of the way of progress.

In the United States we have with increasing success managed to keep politics out of our schools. We are of course not successful in every case, but our progress-line for this matter in general distinctly rises. Certainly with us almost every political interference with education will ultimately be rendered relatively harmless by our great numbers of professionally minded educators and intelligent laymen with high ideals of education. Both these groups in their local areas lead their publics to adopt sound educational policies no matter what the central administrations do. This is possible because we have one language, a high percentage of literacy, and a tradition of allowing educators to develop professionally and to spread their professional views and discoveries to their hearts' content. The Philippine school system is without this tradition and makes no attempt to cultivate it. In a backward people largely illiterate and unable to communicate orally because of the multitude of dialects, this professional freedom could never develop unless deliberately promoted by the central administration.

A true estimate of the Philippine educational administration can be secured only by considering certain possibilities. The American and Filipino governments might have reached some agreement to keep the schools out of politics and have forced each other to live up to the agreement. The educational personnel might have found some way from within to fight off the political pressures, although with the weakening of the American personnel in both numbers and morale by the policy of Filipinization this may be too much to have

expected. The central administration might have deliberately fostered a vast body of local school men and women eager to develop professionally, as have the educators of the United States since 1900, who would have energetically fought all attempts at political interference with schools. Had any one of these possibilities—certainly had every one of them—become an actuality, the story would have been wholly different.

Given safety from all political blights such as those now killing so many branches of the administration, and freedom for professional growth of individuals such as we enjoy, the transplanted school system would have been an altogether different plant. Indeed, with these two favorable conditions for growth, in addition to its great advantage of centralization, the Philippine school system would doubtless have been pronounced by many to be an improvement on the original stock.

V. JOB ANALYSIS AND THE PROBLEM ATTACK IN THE TRAINING OF SUPERINTENDENTS OF SCHOOLS

George D. Strayer

Training for the position of superintendent of schools has, until recently, consisted primarily of apprenticeship. The capable teacher has been given minor administrative responsibility in the school in which he serves. If he has shown some ability in administrative work, he has been appointed to the office of principal. In our smaller school systems the next step in advancement has been to the position of supervising principal or superintendent of schools. It is notably true that men have advanced from the smaller superintendencies to the larger.

This training on the job has all of the virtues and all of the limitations commonly associated with apprenticeship. If the man in training has been fortunate in his associations with competent administrators he may have received a very significant training. If, on the other hand, he has been less fortunate in his associations, he may have achieved his success because of personal qualities which he possesses, not uncommonly that of salesmanship, and may have developed very little efficiency as an administrator.

We have long abandoned the practice of training professional workers in the fields of law, engineering, or medicine by the inadequate and costly apprenticeship method. Considerable progress has been made during the past quarter of a century in the development of professional training for school executives.

Those of us who have the opportunity to work in professional schools of education may profit largely from the experience of other professional schools. It has been established that professional training requires the application of theory to practice. The professional schools are offering their students an opportunity to attack genuine problems and to engage in practice which will develop skill. The engineering student works in the factory, on the railroad or irrigation project, or in some other industrial enterprise as a regular part of his training. The medical student is brought into

contact with his problems in the clinic and laboratory, and later enters upon a period of internship in the hospital. The student of law spends his time largely in the study of cases and in the review of the decisions of the courts. The man who hopes to work as a business executive is given opportunity to work out his solutions of the problems of plant organization, personnel management, the financing of industrial enterprises, the marketing of the product, and the like.

If we are to offer significant training for school executives we shall have to analyze the job of the superintendent of schools, and upon the basis of this analysis present in our courses the problems with which the school executive has to deal.

No complete analysis of the work of the superintendent of schools has yet been made. My colleagues and I have, during the past few years, attempted to select those problems which recur in the experience of all school executives and to organize them for presentation to our students in training. One is impressed, as soon as he attempts this job analysis, to discover the range of knowledge and of skill required of one who would render efficient service in the many situations in which the superintendent of schools is required to act. Among the more important fields in which he must have expert knowledge may be listed the following:

1. The curriculum and courses of study for the whole school system.
2. Methods of learning and of teaching.
3. The organization of schools, with particular reference to the classification and progress of children in the school system.
4. Personnel management, including the selection, assignment, and training of teachers in the service.
5. The financing of the educational program.
6. The business management of schools.
7. Plant management.
8. The development of the school building program.
9. Co-operation with other social agencies.
10. Educational publicity.

In our attempts to analyze the job of the superintendent of schools we have had the co-operation of some hundreds of school executives. Their judgment with respect to the relative importance of the various problems with which they have had to deal has been

checked by some thirty surveys of school systems ranging in size from Lawrence Township, New Jersey, to the city of Baltimore, Maryland. The survey, undertaking, as it does, to evaluate current practice and to establish the program for the future development of the school system, offers a sound basis for the analysis of the work of the superintendent of schools.

The analysis of the job of the school executive discloses the wide range of knowledge and of skill demanded. The superintendent of schools may be called upon to exercise judgment with respect to policies so far reaching as that of modifying the revenue system of the state in which his schools are located, or he may need to pass upon the desirability of purchasing a particular piece of equipment for a science laboratory. He may be called upon to co-operate with the city planning commission in the location of sites for school buildings to be erected during the next twenty-five years, or he may need to pass upon location of electrical outlets on the ceiling of the classrooms as presented in the plans just submitted by an architect. He may have to assume a position of leadership in the location of the curriculum of the junior high school, or he may have the responsibility for making a recommendation with regard to a textbook in geography which is to be provided for use in this school. He may be called upon to plan a budget for the next year, or to pass upon the adequacy of the form of requisition proposed for use in the school system. He must provide a supervisory program which will make possible the continued growth of all members of his staff, or he may be under obligation to interview a teacher who is finding difficulty in adjusting herself to the work to which she has been assigned. He must consider the possible co-operation of the division of physical education and health service in the school system with the public health service in his community, or he may be expected to give sound advice with respect to the surfacing of a playground. And so one might continue to indicate the variety of obligations to be met and of knowledge and skill which must be possessed by the successful superintendent of schools.

It might be argued that, having through the analysis of the work of the school executive determined what knowledge and skill were required, the economical method of training would be to or-

ganize these facts and skills logically and proceed to have the student master them. This, of course, would be contrary to the experience in other professional schools. We have had, I believe, sufficient experience to know that this type of organization of the course for the training of superintendents is not as satisfactory as that involving the presentation of problems and the development of skill and mastery of knowledge and of technique in relation to the situation as the executive has to meet it.

We have assembled a series of problems from the field.¹ I question whether it would be worth while to develop a theoretical problem, however versed one might be in the practical affairs of administration. The challenge of the genuine problem is found not simply in the particular issue which it presents for solution, but also in the other factors of the situation which may modify the solution to be proposed. Even the most adequate possible statement of a problem as it has occurred in the experience of a superintendent of schools does not present quite the challenge which comes from the direct contact afforded by field work.

The job analysis and problem attack as a method of teaching is not intended to substitute debate for knowledge. In our organization of problems for the consideration of students the sources of information available in published articles, monographs, surveys, and the like, are indicated. Nothing could be more fallacious than to propose that students debate the issues of administration without the command of all the scientific knowledge available. The advantage of the problem attack is found in the organization of whatever scientific knowledge is available with reference to a particular professional problem which superintendents of schools have had to solve. There is every reason to believe that as a result of this type of organization the student will command the knowledge available more thoroughly than he would were he merely to read books or to report on scientific investigations.

As the student works on the solution of problems he will find the need for skills or for the mastery of techniques. This work can be best done in the laboratory. If the problem in the class has to

¹ Strayer, Engelhardt, and Others, *Problems in Educational Administration*, Bureau of Publications, Teachers College, Columbia University. Pp. 755.

do with the presentation of facts to the board of education, or to the public, the need for graphic representation will be developed. The only satisfactory way of acquiring skill in this field is to draw graphs and have them subjected to criticism. Of course, the student should have available the standards which have been proposed by competent workers in this field. Occasions will arise, however, if the teaching is adequate, for the development of original graphs portraying facts never before presented in graphic form. And so for many other techniques or skills which the superintendent should command. If he is to become acquainted with the adaptability of calculating machines for work in his office, he will gain most by practice upon them. He will come to have a better appreciation of the importance of a filing system if he can have laboratory experience in this field. His knowledge of accounting and of other business procedures will depend upon the experience which can be furnished through the actual making of entries in books, devising business forms, and the like. Familiarity with the reading of plans and specifications for school buildings as a laboratory exercise will furnish the only sound basis in training for the ability which the superintendent of schools should have in the criticism of plans presented to his board of education. Practice in making age-grade tables, in drawing the profiles for individual students, in developing a classification of pupils for a school upon the basis of complete information concerning pupils is essentially a laboratory job. Skill in making the ordinary statistical calculations as applied to the problems of administration can be best developed in the laboratory under the supervision of competent instructors. And so for many other of the techniques or skills which the superintendent of schools should command.

Field work, provided primarily through the medium of the school survey, offers an additional, and in some respects even a more significant, opportunity to the student of administration. The survey attacks the problems as they actually exist. The recommendations which are made must be sound and they must be carried out if the survey is worth what it costs. It is possible to give to students in training, through the medium of the survey, experience comparable to that which the engineer secures in the factory, or the

doctor in the hospital. All of the knowledge that we have available is demanded of one who would evaluate the work of a school system and propose the program for its development. Every technique or skill which the superintendent of schools should employ in the work with his administrative or teaching staff, with his board, and with his community, is required in the work of a survey that is satisfied with nothing less than improving the efficiency of the school system under review.

For the student who has shown his competence in the solution of problems, both in the classroom and in connection with the survey, and who has come to command the more important techniques of administrative practice and research, intensive work which may result in the development of more satisfactory techniques or more significant knowledge is clearly indicated. Students who have been trained on the basis of the job analysis and problem attack are most conscious of the need of further investigation. For them research is the response of the scientifically minded individual to the recognized needs of his profession. He is in a position comparable to that occupied by the research worker in the Rockefeller Institute or in the graduate school of engineering.

In our work in Teachers College we recognize three levels upon which the student may work, all of which are dependent upon the analysis of the work of the school executive and upon the solution of the problems which confront him. In the first year's work problems are presented for solution, together with the data now available and an analysis of the method of attack. The solution will, as has already been indicated, in many cases require the mastery of some special skill or technique. The solution of the problem is brought before the group for class discussion. The work during a part of the year is based upon field experience in which the problems presented for solution are grouped in the relationship in which they actually occur in the experience of superintendents of schools because they center in a single school system.

The second year's work calls for the analysis of the complete situation and the definition of the individual problems of greatest importance by the student himself. Guidance and co-operation are furnished by the members of the staff, but large responsibility is

left to the individual student, and he is encouraged to follow through the work in some particular field beyond the solution of the specialized problem which he may have discovered in a particular school system. This intensive study may later lead to the development of a significant scientific inquiry. The majority of our students complete their work for the diploma of superintendents of schools at the end of the second year period. For the less experienced of this group we are developing a program of "interneship" in progressive school systems. This arrangement continues the opportunity for the solution of the problems of the superintendent of schools. It offers an advantageous kind of co-operation, both for the superintendent and for the man in training. With two years of sound professional training already accomplished, the student may reasonably be expected to conduct inquiries and to participate in the administrative work of the school system. As he becomes familiar with the ideals and practices of the particular school system in which he is working, more and more responsibility can be given to him. At the end of a year of such interneship a man can ordinarily render service of sufficient significance to place him on the regular pay-roll of the school system in which he has served in interneship, or in some other. During his year of training payment for his services should be on the basis of the schedule provided for heads of departments in high schools or similar minor administrative positions.

A relatively small group of men should be encouraged to continue their university work and to undertake those researches which will result in the improvement of professional practice. The emphasis in the investigations undertaken should be upon the problems of the superintendent of schools. There is scarcely a problem which confronts the school executive for which we have adequate knowledge, and hardly a method of procedure for which the technique is finally established. It is most worth while to inquire concerning the techniques to be employed in the development of a school-building program, the way to secure more adequate janitorial service, the most efficient organization of a department of census and attendance, the most equitable method of distributing state

support, the necessary budgetary provision to be made for the equipment of new buildings, or the most efficient method of acquainting the people with the work of the school system. Surely research may not be considered less worthy because it is devoted to the solution of problems which confront the professional worker.

It is of the utmost importance that the highly technical work of the specialized courses be paralleled with other training in the theory and practice of education. No one would seriously propose that a man was fit to be a superintendent of schools unless he was well grounded in the philosophy of education. Many of the administrative problems which he will have to meet will require a knowledge of the principles and of the results of investigations in the field of psychology and sociology. The success of the superintendent of schools will often be determined by his knowledge in the fields of public finance and municipal administration. Much light would be thrown upon many of the problems with which the superintendent has to deal by courses in comparative education.

In addition to his study in these fundamental fields which furnish the background for the technical courses, the superintendent of schools should have contact with other professional work in the school of education. The more he can learn with respect to the teachers' work in the classroom, the more certainly he is acquainted with the detail of the work of principal or supervisor, the better qualified he will be for the general administrative position. The ideal situation would be one in which those seeking to qualify for the position of superintendent of schools would have brought to their attention the work of all of these specialists in relation to the particular problems which the superintendent has to solve. If the technical course is dealing with the problem of equipping the elementary school building, the specialists in kindergarten and primary education, in household arts, in industrial arts, in library maintenance and operation, in physical education and health service, in music and art, should be called into conference and should propose and defend the recommendations with respect to specialized equipment. In like manner, if the issue before the superintendents' group is that of curricula, subject-matter specialists and

supervisors responsible for the teachers' growth should play a large part in the solution of the problems presented in the professional course.

It is important that the courses in psychology, the history and philosophy of education, in taxation, and finance, and municipal administration be presented from the point of view of the administrator. The examination of any one of these fields will make apparent the validity of this contention. It is not just psychology that the superintendent of schools needs, but rather the application of the principles of psychology and of the investigations that have been made to the problems of the organization of schools, the classification of pupils, and the validity of methods of instruction. In the history of education the administrator needs most of all a discussion of the practices which have prevailed in the past, and particularly those which have been developed in his own field, rather than a consideration of historical theories.

But the principal emphasis in professional courses for the training of superintendents of schools must be upon the analysis of the work to be done, and the development of the techniques essential to the adequate solution of the problems the administrator must solve. The more certainly the student deals with genuine problems during his period of training, the more likely he will be to meet with success in the field. Knowledge of the facts of educational administration cannot be substituted for practice in applying these facts to the solution of administrative problems. It is just as certainly possible to provide definite professional training for the superintendent of schools as it is for the doctor, lawyer, or engineer. With the development of these professional courses we may confidently expect an increase in the efficiency of workers in this most important branch of the public service.

VI. THE EVALUATION OF TWO METHODS OF TEACHING SPELLING

Clifford Woody

PURPOSE

The purpose of the present report is to set forth the results of an investigation conducted in Grades VI, VII, and VIII of the public schools of Adrian, Michigan, during the second semester of the 1924-25 school year. This investigation was an attempt to throw some light on the influence of what might be termed the "traditional" method of teaching spelling and of a variation of what is known as the "test and study" method on the temporary and permanent mastery of how to spell given lists of one hundred words and on the number and persistency of the errors made during the period of the investigation.

METHOD

In order to measure the influence of the two methods of teaching spelling, a list of one hundred words was selected from appropriate columns of the Iowa spelling scale for each of the enumerated grades. The children in these grades were then tested with the respective lists of words in order to determine to what extent they knew how to spell the words at the beginning of the investigation. On the basis of these results and of the results obtained from the giving of Otis self-administering test of mental ability and on the basis of the superintendent's opinion of the relative equality of the teachers in different classes and of the relative equality of the social environment of the pupils attending the different schools the classes in each grade were divided into two groups possessing as nearly as possible the same mental abilities and the same opportunities for learning. With one group of pupils, to be referred to hereafter as the control group, the teachers taught the selected list of words by means of the traditional method; in the other group of pupils, to be referred to as the experimental group, the teachers taught the same list of words by utilizing a variation of the test and

study method. The same amount of time, twenty minutes per day, was utilized with both methods, although, as will be seen later, provision was made for excusing children in the experimental group from the study of spelling on certain days provided they spelled all of the words correctly on the designated tests. This provision was made in an attempt to stimulate the pupils in the experimental group to exert maximum effort and to allow the teachers in this group to use their allotted time in concentrating on those pupils who needed drill on particular words. The same number of new words, twenty per week, were taught. Special precaution was taken to prevent children from studying the words at home or at other times than those especially set aside. In fact, extreme care was taken to control all conditions so that variation in method would be the one outstanding variable which might influence the results. At the end of five weeks, during which time all of the words of the different lists had been taught, the children were tested on the total list of one hundred words. This test, referred to as the final test, made possible the determination of the amount of temporary gain resulting from the teaching. One month later, during which time there was no reviewing of the words, the children were retested on the total list of one hundred words. Four weeks later, i.e., two months after the instruction upon the given word lists had ceased, the children were again tested on the total list of one hundred words. During the first week of September, after the summer vacation, during which time no instruction upon the words was given, children who were then available were again tested on the list of one hundred words. These last three tests were given to measure the permanent effects resulting from the period of instruction and to throw some light on which of the two methods of teaching had resulted in greater permanent gains in the knowledge of how to spell the words. These last three tests, when considered with the tests given at the beginning of the investigation and the one given at the end of the teaching period, made it possible to study the influence of the two methods on the number and persistency of the errors made.

It is impossible to give all of the details of the method employed in the conduct of this investigation, but it seems well at this

point to add that during the five weeks in which the words were taught, a definite record of the responses made by the child each time he was given a written test on any list or portion of a list of words was kept. Thus, during the entire course of the investigation, including both the period of teaching and that after teaching, eight different responses were recorded for each child with perfect attendance throughout the investigation in the control group and ten different responses for each child with perfect attendance in the experimental group. While this report concerns itself mostly with errors made in the tests before and after teaching, the records on the tests during the teaching period are useful in providing supplementary evidence for the conclusions reached.

Description of the two methods.—The following excerpts reproduced from the general plans and instructions governing the conduct of the investigation will make clear the outstanding differences in the two methods of teaching spelling. These excerpts, though somewhat abridged and slightly re-edited for the purpose of this report, indicate clearly the exact procedures followed.

DETAILED PROCEDURE FOR TEACHING THE WORDS

METHOD I

1. The teacher will teach on the first four days of each week five new words per day chosen from the list of twenty words designated for the particular week concerned; on the fifth day she will review the twenty words assigned for the week. Each day during the week the teacher will review the words misspelled on the previous days of that week.
2. The teacher will teach the words according to the following method:
 - a) The teacher will write each word in turn on the board and pronounce it slowly as she writes.
 - b) The teacher will develop the meaning of the word by having the children use it in sentences, if the word is in their speaking vocabularies, or by using it in a sentence herself.
 - c) The teacher will indicate the syllables by means of slight pauses in pronunciation or by underlining the different syllables. She will ask the class to pronounce the word in concert and to indicate the syllables by slight pauses.
 - d) The teacher will underline the difficult parts of the word as the children indicate them for her. She will ask individual pupils to spell the word orally, or the class to spell it silently.

- e) The teacher will direct pupils to look carefully at the word, then close their eyes, try to see the letters of each syllable, spell it silently, and then check by looking at the word on the board.
- f) The teacher will direct the children to look at the word, write it, and spell it silently as they write, and then make comparison with the word on the board. The teacher will continue this process until the children have spelled each word three times.
- g) After presenting each word of the assignment in this manner, the teacher will allow the children a few minutes for study. She will let each child study the words which presented difficulty, will let him utilize whatever method of study helps him most, and will let him study whatever words he misspelled on the previous days of the particular week concerned.
- h) In the latter part of the spelling period the teacher will test the pupils on the day's assignment after the fashion outlined in the section under the general procedure,¹ save that the papers need be scored but once and the scores need not be recorded on the teacher's general report sheet.²

3. On Friday of the week the children will spend ten minutes in reviewing the words assigned during the previous four days. Special attention should be given to the words studied on Thursday. During the last ten minutes of the period, teacher will test on the week's assignment after the fashion outlined in Section 5, under general procedure, with the exception noted.

4. The procedure in each succeeding week is the same as outlined in the preceding sections (1-3).

METHOD II

1. The same twenty words per week will be taught in the classes using Method II as in the classes using Method I. After the first week with Method II there is provision for testing on the words for the week under consideration and on the words for the previous week. If any of the words of the previous week are misspelled, there is some provision for studying these particular words. Item 2 of this section will make this point clear.

2. The methods employed during each week are as follows:

Monday.—

- a) The teacher, after having written the list of twenty words on the board, will have the children practice pronouncing the different words.
- b) The teacher will develop the meaning of each word by having the children use it in a sentence, if the word is in their speaking vocabularies, or by using it in a sentence herself.
- c) The teacher will then test the children on the whole list of twenty words after the fashion outlined under general procedure.

¹ Sections on general procedure and teachers' general report sheets are not reproduced in this article.

² See footnote 1.

- d) The teacher will have each child make a list of the words misspelled and study them as his assignment till the next testing day.
- e) The teacher will excuse all pupils who spelled all of the words correctly from further study of the words.

Tuesday.—³

- a) The teacher will direct each pupil to study those words missed on Monday's test.
- b) The teacher will direct the children to pronounce each word silently and then spell it silently. (The teacher may have individual children pronounce different words to her to make sure that the children know how.)
- c) The teacher will direct the children to look at a word carefully, cover it, write it and spell it silently as they write, and compare it with the correct spelling on the board.
- d) The teacher will direct the children to continue this process until they have spelled each word at least three times. She will direct any child who is unable to write any word correctly after writing it three times in this manner to continue studying by this method until he can spell the word correctly. Obviously the children must assume responsibility for following this method of study, for presumably each child is studying a different list of words.
- e) The teacher will utilize the whole twenty-minute period in this type of drill. She will not attempt to test on the words till Wednesday.

Wednesday.—⁴

- a) The teacher will follow the same procedure as on Monday, but less time may be taken in pronouncing the words and developing their meaning. During the first week the teacher will test all children on the list for the first week, but in all other weeks she will test on the words for the week concerned and on those for the previous week.
- b) The teacher will have each child make a list of the words misspelled and study them as the spelling assignment for the next day.
- c) The teacher will comment on the progress manifest in the number of words correctly spelled on Wednesday, if progress has been made.
- d) All pupils who spelled all of the words correctly are excused from the study of spelling on Thursday.

Thursday.—

- a) The procedure is the same as on Tuesday.

Friday.—

- a) The procedure is the same as on Wednesday. No pupil is excused from taking the test on Friday.

³ A child who spelled all of the words correctly on Monday is excused from the study of spelling on Tuesday.

⁴ No pupil is excused from taking the test on Wednesday.

Table I, in which essential elements of the two procedures are placed in juxtaposition, will aid in the visualization of the outstanding differences between the two methods.

The word lists.—The word lists for each grade consisted of one hundred words selected from the Iowa spelling scale. The expected percentage of correct spelling on the list of words for Grade VI, from the standards given on the scale, was 50 per cent; on the list for Grade VII, 48 per cent; on the list for Grade VIII, 68 per cent.

TABLE I
OUTSTANDING DIFFERENCES BETWEEN THE TWO METHODS OF TEACHING SPELLING

Method I (Control)	Method II (Experimental)
<ol style="list-style-type: none"> 1. Five new and 5 review words taught each day 2. Children study words before being tested on them 3. Teacher directs all children in study of each word 4. All children must study the words assigned 5. Teacher largely controls formation of habits of study 6. Children tested on 10 words of daily assignment for 4 days of week and on 20 words assigned for the week on Friday 7. Children tested on each word three different times 8. Some testing of spelling each day of the week 	<ol style="list-style-type: none"> 1. Twenty words per week given on first day 2. Children tested on words before studying them 3. Children study only words missed on test 4. Children spelling correctly all words on tests are excused from study of words 5. Pupils must assume greater amount of responsibility in formation of study habits 6. Children tested on 20 new words per week on Monday, Wednesday, and Friday and on 20 words of previous week on Wednesday and Friday 7. Children tested on each word five different times 8. No testing of spelling on 2 days of the week

There was considerable variation in the difficulty of the different words of a given list because the limited number of words on a given step of the scale necessitated selecting the words from several different steps. In planning the investigation it was the intention to select only those words from columns which indicated that the expected standard of spelling achievement was approximately 50 per cent correctly spelled, but the number of such words was insufficient for making up the list for Grade VIII. Consequently, in that grade easier words had to be chosen. The idea underlying the choosing of words having an expected standard of 50 per cent correctly spelled was to have lists of sufficient difficulty to guarantee that the children would be unable to spell the words at the beginning of the investigation.

Each list of words for a given grade was divided into five different groups of twenty words. Each of these groups of words constituted the words to be taught during a specified week. In the determination of these different groups of words there was no attempt to form five different groups of words of equal difficulty, although later development in the investigation indicated that it might have been well to have done so. The need for this is especially noticeable in the results for Grade VIII.

TABLE II

ILLUSTRATIVE DATA SHOWING METHOD EMPLOYED IN THE SELECTION OF PUPILS OF EQUAL ABILITY FOR THE CONTROL AND EXPERIMENTAL GROUPS

NUMBER OF PUPIL	CONTROL GROUP				EXPERIMENTAL GROUP				
	Age		Mental Score	Initial Spelling Score	Number of Pupil	Age		Mental Score	Initial Spelling Score
	Years	Months				Years	Months		
9..... 17..... 7..... 8..... 4.....	Grade VII (Girls)								
	14	11	109	42	3	13	4	104	40
	12	10	128	57	17	11	11	122	56
	13	3	104	19	14	13	8	102	29
	Grade VII (Boys)								
	12	4	116	35	10	12	8	120	40
	15	1	93	17	15	15	4	91	31

Tabulation of the data.—The first step in the tabulation of the data was to determine which pupils in the control and experimental groups had perfect attendance during the teaching period and for all tests. The second step was to check the scoring of all tests, including the mental tests given at the beginning of the investigation, the spelling tests given before and after the teaching period, and the spelling tests obtained during the period of teaching. The third step consisted in selecting pupils in the different grades to constitute the control and experimental groups. In selecting these pupils every effort was made to choose two groups of equal ability. Thus, from those pupils in each grade having perfect attendance, pairs of pupils were selected who could be matched on the following criteria: sex, age, mental score, and score on initial spelling test.

The exact method of matching is made clear in Table II. To illustrate, pupil No. 3 of the experimental group, a girl in Grade VII, thirteen years and four months of age, with a score of 104 on the mental test and a score of 40 on the initial spelling test, was paired with pupil No. 9 in the control group, a girl fourteen years and eleven months of age, with a score of 109 on the mental test and a score of 42 on the initial spelling test. It is noted that no pair of the pupils was exactly matched on the different criteria, but the limited number of pupils from which the pairs were to be selected precluded perfect matching. Usually the inequalities in matching were balanced so that the central tendencies and the standard deviations, as will be shown later, were approximately equal. Since the number of pairs of matched pupils having perfect attendance was so small, a similar process was instituted with the pupils who were absent not more than two days during the teaching period but who had taken all of the different tests.

The final step in the tabulation was the determination of the amounts of gain made by these matched groups of pupils under the influence of the two different methods and the determination of the number of misspellings on the initial test in spelling which persisted in identical form in the tests after the period of teaching, and the total number of different misspellings resulting from the use of the two methods of teaching. In the tabulations dealing with gains, the unit of comparison was the gain made by the individual pupil on the total list of one hundred words; in the tabulations dealing with errors, the errors per week on the twenty words assigned for that week.

RESULTS

The equality of the control and experimental groups.—Tables III and IV exhibit the number of pairs of pupils in the control and experimental groups and the means and standard deviations resulting from the matching of the pupils on the different criteria enumerated in the previous section. The numbers of pairs of pupils under consideration were small in view of the fact that at the beginning of the investigation there were in the control group 67, 77, and 73 pupils in Grades VI, VII, and VIII, respectively; in the experimental group, 59, 76, and 66 pupils. However, when it is re-

called that this investigation was launched near the beginning of the second semester and extended through the summer vacation to

TABLE III

MEANS AND STANDARD DEVIATIONS FOR THE CONTROL AND EXPERIMENTAL GROUPS MADE UP OF CHILDREN HAVING PERFECT ATTENDANCE THROUGHOUT THE PERIOD OF THE INVESTIGATION

	CONTROL GROUP		EXPERIMENTAL GROUP	
	Mean	S. D.	Mean	S. D.
Grade VI (15 pairs):				
Age.....	12-0	9 mos.	12-3	8 mos.
Mental test.....	100.2	14.0	101.0	13.4
Initial test in spelling....	43.4	20.8	43.7	20.7
Grade VII (14 pairs):				
Age.....	13-7	9 mos.	13-6	1-3
Mental test.....	103.3	13.1	102.6	12.6
Initial test in spelling....	30.6	13.2	31.9	16.2
Grade VIII (11 pairs):				
Age.....	14-5	10 mos.	14-4	9 mos.
Mental test.....	107.5	12.9	105.3	12.7
Initial test in spelling....	49.5	25.7	50.6	18.1
All grades (40 pairs):				
Age.....	13-2	1-1	13-3	1-3
Mental test.....	103.3	13.7	102.8	13.0
Initial test in spelling....	40.6	21.5	41.5	20.0

TABLE IV

MEANS AND STANDARD DEVIATIONS FOR THE CONTROL AND EXPERIMENTAL GROUPS MADE UP OF CHILDREN HAVING NOT MORE THAN TWO DAYS ABSENCE DURING THE TEACHING PERIOD OF THE INVESTIGATION

	CONTROL GROUP		EXPERIMENTAL GROUP	
	Mean	S. D.	Mean	S. D.
Grade VI (20 pairs):				
Age.....	12.3	11 mos.	12.8	11.9 mos.
Mental test.....	98.8	13.5	100.0	14.8
Initial test in spelling....	44.2	21.0	45.3	22.3
Grade VII (27 pairs):				
Age.....	13.6	11.7 mos.	13.5	12.2 mos.
Mental test.....	100.5	14.1	100.8	14.2
Initial test in spelling....	27.1	14.4	28.5	15.7
Grade VIII (23 pairs):				
Age.....	14.5	8 mos.	14.5	10 mos.
Mental test.....	106.0	11.5	105.1	11.8
Initial test in spelling....	54.8	23.4	52.9	20.6
All grades (70 pairs):				
Age.....	13.5	12.1 mos.	13.5	12.4 mos.
Mental test.....	101.8	14.2	102.0	13.8
Initial test in spelling....	41.1	22.9	41.3	22.1

the end of the first week in September, when it is stated that the schools had to be closed because of an epidemic for a period of two weeks after the investigation was begun, and when the stringency of the criteria employed in matching is considered, it is surprising that the number of cases was as large as it was and that the matchings of the pairs were as close as they were. In each grade and in the totals for all grades the means were approximately equal; the standard deviations were in all cases large, but usually the standard deviations of comparable groups did not differ by alarmingly great amounts. While the number of cases and the matchings were less perfect than desired, it is ventured that with these groups matched according to grade, sex, and attendance, and approximately matched in age, mental ability, achievement on the initial spelling test, and in educational and social environment, the two methods can be evaluated more accurately than in investigations in which various of these factors are disregarded.

Comparison of the gains.—Table V exhibits the gains in the control and experimental groups made on the various tests by the pupils in the different grades having not more than two days of absence and the differences in the gains expressed in terms of the standard deviation of the difference of the means. In this table the means of the gains are given in columns 3 and 5; the standard deviations of the distributions of the gains, in columns 4 and 6; the differences between the means of the gains, in column 7; the standard deviations of the differences of the means in column 8; the ratio for the differences of the gains and the standard deviations of the difference of the gains, in column 9. The standard deviations of the means needed in the calculation of the standard deviation of the differences of the mean gains are not given, although they can be obtained easily since the number of cases under consideration in each grade is given. The main points of interest in the table are the small amounts of difference in the gains in the control and experimental groups and the fluctuations in the direction of the differences on the various tests and in the different grades. The actual differences of the means of the gains varied from .1 per cent on the final test in Grade VI to 8.9 per cent in that same grade on the test given one month after the cessation of the teaching period.

Eight of the twelve differences are less than 4 per cent. In terms of the ratio of the standard deviations of the differences of the gains to the differences of the means of the gains, none of the ratios is as large as 2, and only three of them are between 1 and 2. The size of these ratios indicates that the differences in the two groups have little or no significance. This indication is strengthened when consideration is given to the fact that in Grade VI all differences are in favor of the control group; in Grade VII, all differences in favor of

TABLE V*

GAINS IN THE CONTROL AND EXPERIMENTAL GROUPS MADE ON THE VARIOUS TESTS BY PUPILS IN THE DIFFERENT GRADES HAVING NOT MORE THAN TWO DAYS' ABSENCE AND THE DIFFERENCE IN THE GAINS EXPRESSED IN TERMS OF THE STANDARD DEVIATION OF THE DIFFERENCE OF THE MEANS

GRADE	TEST	CONTROL GROUP		EXPERIMENTAL GROUP		DIFFERENCE OF MEANS	S.D.D.	DIFFERENCE S.D.D.
		Mean	S.D.	Mean	S.D.			
VI (20 pairs) . . .	{ Final	44.8	12.9	44.7	12.9	— .1	4.07	— .02
	{ 1 month later	49.8	7.9	40.9	19.2	— 8.9	4.63	— 1.92
	{ 2 months later	45.1	12.5	40.4	17.3	— 4.7	4.78	— .98
	{ September	31.4	21.9	27.8	20.1	— 3.6	6.66	— .54
VII (27 pairs) . . .	{ Final	47.2	14.5	51.4	18.4	4.2	4.50	.93
	{ 1 month later	46.2	17.4	48.9	18.1	2.7	4.83	.56
	{ 2 months later	45.6	17.1	49.1	19.2	3.5	4.94	.71
	{ September	36.4	21.2	37.1	17.9	.7	5.33	.13
VIII (23 pairs) . . .	{ Final	33.1	12.1	36.7	9.8	3.6	3.24	1.11
	{ 1 month later	35.9	7.5	34.4	11.8	— 1.5	2.91	— .52
	{ 2 months later	35.2	10.4	34.4	12.3	— .8	3.35	— .29
	{ September	28.5	18.3	33.5	11.4	5.0	4.50	1.11

* The differences not preceded by negative signs are in favor of the experimental group.

the experimental group; in Grade VIII, two differences in favor of the control group and two in favor of the experimental group. These same general tendencies are corroborated in similar data for the children in the control and experimental groups having perfect attendance. The data for these children are not presented because of lack of space, although the nature of the tendencies will be manifest in the next table.

Table VI, presenting a summary of the gains made in the control and experimental groups in all grades combined and of the differences of the gains expressed in terms of the standard deviations of the differences of the means, emphasizes the tendencies men-

tioned in the previous section. The differences between the means of the gains obtained in the two groups are small, and when expressed in terms of their standard deviations, the resulting ratios indicate that the differences have little significance. It is interesting that in the group of children having perfect attendance and in the group having not more than two days' absence, the experimental group made greater gains on the final test and on the test given

TABLE VI*

SUMMARY OF THE GAINS IN THE CONTROL AND EXPERIMENTAL GROUPS ON THE DIFFERENT TESTS BY THE CHILDREN HAVING PERFECT ATTENDANCE AND THOSE HAVING NOT MORE THAN TWO DAYS' ABSENCE AND THE DIFFERENCES IN THE GAINS EXPRESSED IN TERMS OF THE STANDARD DEVIATION OF THE DIFFERENCES OF THE MEANS

GRADE	TEST	CONTROL GROUP		EXPERIMENTAL GROUP		DIFFERENCE	S.D.D.	DIFFERENCE S.D.D.
		Mean	S.D.	Mean	S.D.			
All grades (40 pairs).....	{ Final 1 month later 2 months later September	Perfect Attendance						
		44.0	13.3	46.1	14.1	2.1	3.06	.69
		47.4	12.0	43.6	15.9	-3.8	3.14	-1.21
		44.6	12.8	44.4	14.3	-.2	3.03	-.07
		36.7	18.5	37.7	14.8	1.0	3.74	.27
		Not More than Two Days' Absence						
		41.9	15.0	44.7	15.2	2.8	2.55	1.10
		43.8	15.5	41.8	17.3	-2.0	2.77	-.72
All grades (70 pairs).....	{ Final 1 month later 2 months later September	42.0	16.2	41.8	17.2	-.2	2.82	-.07
		33.6	22.2	36.4	17.7	2.8	3.40	.82

* The differences not preceded by negative signs are in favor of the experimental group.

in September, and the control group made greater gains on the other two tests. The lack of consistency in these results is probably due to chance.

Figure I, based upon the data of the last column of Table VI, portrays most vividly the significance of differences of the gains in the two groups. At the top of the figure is a scale showing various degrees of probable differences as usually agreed upon by statisticians. Note that none of the bars representing the differences of the means expressed in terms of their standard deviations extend into the zones of "probable differences." In fact, most of the bars

lie in the zones which indicate "probably no difference" in the scores attained in the two groups. Note also that with pupils having perfect attendance and those having not more than two days' absence, two of the bars extend to the right, and two to the left, of the zero line.

Thus, on the basis of facts representing the gains made, the only conclusion evident is that the traditional method of teaching

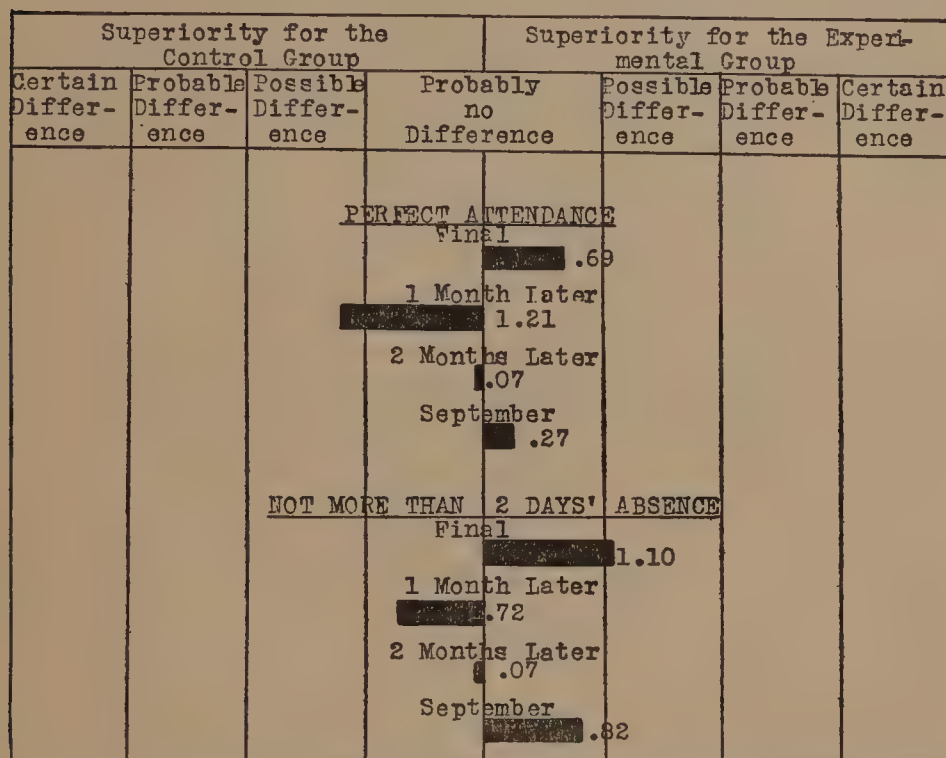


FIG. 1.—Difference in means for the two methods in the various spelling tests, in terms of the standard deviation of the differences, for the pupils in all grades having perfect attendance and for those having not more than two days' absence.

spelling used in the control group results in as great gains as the variation of the test and study method.

Comparison of errors in spelling resulting from the different methods.—Table VII, portraying facts dealing with the influence of the two methods upon the errors in spelling the words, indicates that there is no significant difference between the two methods on the misspellings which occurred. The first section of the table is merely the converse of the facts in Table VI, in that Table VII pre-

sents the facts concerning errors in spelling, and Table VI, the facts concerning the amount of correct spelling. Comparisons of the mean errors per week on the various tests and of the standard deviations of the distributions or of the means reveal some slightly fluctuating tendencies, but the differences in the means, when ex-

TABLE VII*

THE DIFFERENCES IN THE MEAN NUMBER OF ERRORS MADE PER WEEK BY THE PUPILS IN ALL GRADES IN THE CONTROL AND EXPERIMENTAL GROUPS ON THE VARIOUS TESTS AND THE SIGNIFICANCES OF THESE DIFFERENCES EXPRESSED IN TERMS OF THEIR STANDARD DEVIATIONS

TEST	CONTROL GROUP			EXPERIMENTAL GROUP			DIFFER- ENCE OF MEANS	S.D.D.	DIFEE- RENCE S.D.D.
	Mean	S.D.D.	S.D.M.	Mean	S.D.D.	S.D.M.			
Final..... 1 month later..... 2 months later..... September..... Final..... 1 month later..... 2 months later..... September..... Final..... 1 month later..... 2 months later..... September.....	Total Number of Errors								
	42.4	19.9	5.3	31.8	18.9	5.0	-10.6	7.3	-1.45
	33.1	22.3	6.0	39.2	14.0	3.7	6.1	7.0	.88
	37.9	19.9	5.3	37.4	16.9	4.5	-.6	7.0	-.08
	59.0	17.2	4.6	54.6	19.8	5.3	-4.4	7.0	-.62
	Number of Different Errors								
	37.9	16.2	4.3	29.7	15.7	4.2	8.1	6.0	1.35
	28.0	18.9	5.1	36.9	13.5	3.6	-8.9	6.2	-1.43
	33.7	16.1	4.3	33.6	11.8	3.2	.1	5.4	.03
	51.1	15.0	4.0	48.5	11.6	3.1	2.6	5.1	.52
	Number of Identical Errors								
	6.86	4.26	1.14	6.14	3.98	1.06	-.71	1.55	-.44
	5.36	4.12	1.10	6.43	3.27	.87	1.07	1.40	.76
6.21	3.89	1.04	4.93	2.63	.70	-1.28	1.26	-1.02	
8.86	2.10	.56	8.86	2.88	.77	0.0	.95	0.0	

* The differences not preceded by negative signs are in favor of the experimental group.

pressed in terms of their standard deviations, show that the fluctuating tendencies are not significant. Apparently there was no difference in the influence of the two methods on the general number of errors made. This conclusion is to be expected, since the previous section indicated that in resulting gains there was no difference in the effectiveness of the two methods. The second section of the table, showing facts concerning the number of different errors in spelling, indicates that there were as many different errors with one method as with the other. It is true that the means and stand-

ard deviations show slightly different tendencies on the various tests, but the differences in the means expressed in terms of their standard deviations show that these varying tendencies are more apt to be chance than real tendencies. The third section of the table, presenting for the different tests the facts concerning the number of errors which were identical with the errors made on the

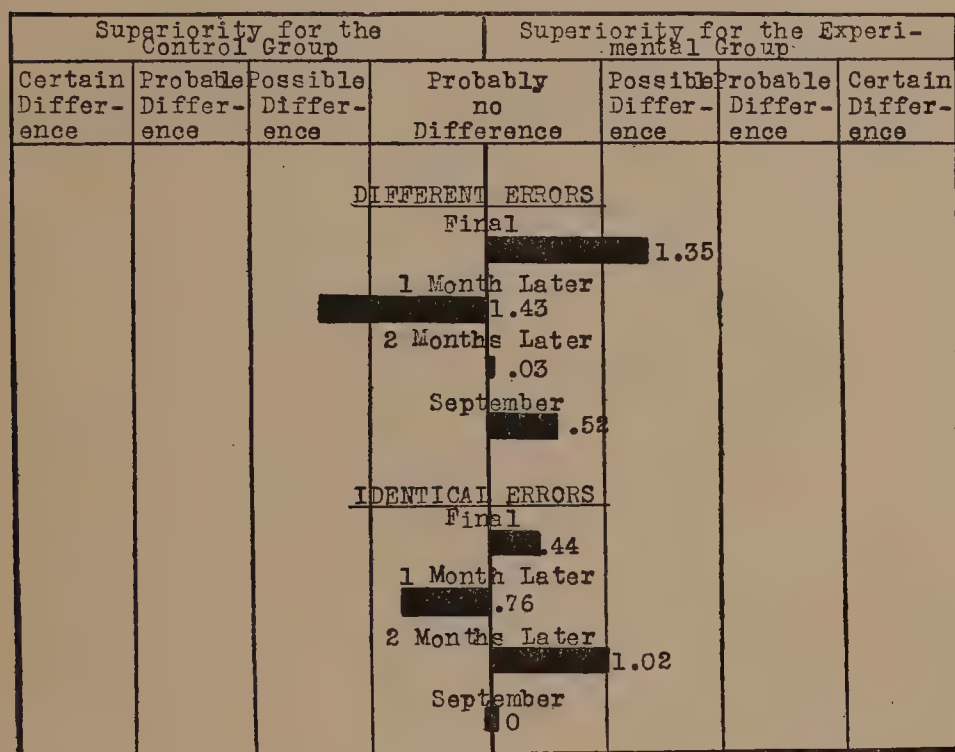


FIG. 2.—The significance of the differences per week in the total number of different errors and the number of identical errors made by the control and experimental groups for all grades on the various tests after the cessation of teaching, expressed in terms of the standard deviation of the differences.

spelling in the initial test administered before opportunity for studying the words was given, indicates that there was no significant tendency in the two methods to cause the errors made in the first spelling of the word to persist.

The significance of the facts given in the second and third sections is presented most vividly in Figure 2. The bars, representing the differences of the means expressed in terms of their standard deviations, in most cases lie in the zones of "probably no difference." None of the bars reaches to the zone of "probable difference." The

fact that part of the bars extend to the right of the zero line and part to the left only emphasizes the conclusion that the prevailing differences are chance rather than real differences.

Facts similar to those given in Table VII and Figure 2 are being collected for all children in the control and experimental groups having not more than two days' absence, but the tabulation is unfinished. The tabulation for the children in Grade VII is almost completed, and it is safe to say that the tendencies manifested are in keeping with the tendencies previously stated.

Thus the evidence, as presented, clearly indicates that there was no outstanding difference between the two methods in influencing the number of different errors or on the persistency of the errors identical with those made in the first misspelling of the word on the initial test. If these generalizations are true, they offer no solace to those who condemn the test-before-study method of teaching spelling on the grounds that this method, by not allowing the child to study the words before being tested on them, offers much opportunity for the first impression of the word to be the wrong impression, and thereby becomes the persisting impression. While it is true in this investigation that all children were tested on the different word lists before the period of active teaching began, and thus were given opportunity for getting wrong first impressions of many of the words, the simple fact that no difference in the results existed suggests this criticism of the test-before-study method is unsubstantiated.

It is true that the identical errors made on the first spelling of particular words tended to persist, but examination of the errors made on these three hundred words suggests that this tendency for errors made on the initial test to persist resulted from the particular nature of the words involved, rather than from the nature of the method of teaching utilized. When all of the three hundred words were taken into consideration, the persistence of the initial error was as evident with one method as with the other.

CONCLUSION

The one conclusion to be drawn from the evidence submitted is that there was no significant difference resulting from the use of the two methods, either from the standpoint of the gains made or from

the influence of the methods on the total number of errors, the total number of different errors, or on the number of errors made on the first tests persisting in any of the later tests. While it is true that the number of cases involved in the investigation is small, when consideration is given to the precautions exercised in determining the control and experimental groups and when it is recalled that the results involved each child being tested on a list of one hundred words at least five different times scattered over a term of approximately eight months, that the same tendencies were manifested on all tests given after the period of teaching (i.e., the final test, the test given one month later, the test given two months later, and the test given in September after the summer vacation), and that the same tendencies were manifested in both the groups of pupils having perfect attendance and in the groups having not more than two days' absence, it seems that the conclusion is justified.

It should be pointed out that this conclusion is based merely upon the levels of achievement attained, and does not take into consideration the fact that a few children in the experimental group may have saved a little time through being excused from the study of the words on particular days. In setting up the conditions of the investigations the emphasis was placed upon which of the two methods would result in greater mastery of the words, and not upon the amount of time which might be saved in the experimental group. In setting up the investigation the interest was centered around the activities of the teacher during the twenty minutes allotted to the teaching of the words, and it was assumed if children in the experimental group should master the knowledge of how to spell the words so that they could be excused from studying them, that surely this fact would be manifested in a superior achievement on the various tests which would be given after the period of teaching; provided, of course, the results obtained in the control group did not approximate perfect mastery. However, the results just presented did not show a superiority in achievement for the experimental group. Whether the two methods would show similar results with a different "set-up," in which the amount of time consumed in learning the individual words of each list would be the criterion of evaluation rather than the achievement attained, is a problem for further investigation.

VII. A STUDY OF THE CAUSES OF ELIMINATION IN A COLLEGE OF LIBERAL ARTS FOR WOMEN

Agnes L. Rogers

Restlessness and dissatisfaction—so characteristic of our day and generation—have attacked the colleges of liberal arts for women. Discussions by the alumnae of these institutions seem “sicklied o’er with the pale cast” of doubt and criticism; comment by those who have had no contact with them is apt to be scathing.

Such censure is not limited to one aspect. Administrative features, as well as the curriculum, are criticized. The shortness of the college year, the rising cost of residence at these institutions, the system of compulsory attendance at classes are instances of the administrative features that have been assailed. The introduction of honors courses and the tutorial plan in a number of colleges is a symptom and a result of the general desire to amend.

The curriculum, however, has been the obvious target for critics, who not merely question the number of prescribed studies, but likewise assert that many subjects desirable as a preparation for modern life are not available. It is contended that entrance and graduation requirements lag far behind present needs by stressing traditional disciplines unduly. It is also, though less frequently, complained that the content of courses that ought properly to be included in any liberal arts college is apt to be inadequate, since it is so often based on the assumption that those studying intend to go on to graduate work, whereas in most cases they are persons who will have no further formal instruction in the subject. Also the selection of material within a subject neglects the future activities and special interests of women. It is generally true that the most serious efforts to amend the college curriculum take the form of changing the number of hours allotted to subjects, rather than of reconstructing content in the light of the future pursuits of women.

This, indeed, is the root of the matter, as it presents itself to a large number of alumnae, namely, that the purpose of institutions for the higher education of women has been obscured; that such in-

stitutions have accepted uncritically the curriculum of the traditional college for men; and that today the objectives of higher education must be redefined for women and an educational instrument created that will train them adequately to meet the demands made upon them after graduation.

The critics of the colleges of liberal arts for women are of two classes. The first includes those who, from observation and experience, have come to the conclusion that change is urgent. Frequently their opinion is based on a narrow and limited opportunity for arriving at the facts. Headmistresses of secondary schools receive reports from their former students of the impression college has made on them. The tendency to consult students when determining the value of their course seems on the increase. We have witnessed Dartmouth, Barnard, and Bryn Mawr students suggesting curricular changes; and possibly other institutions, inspired by their example, have had student committees at work, though less notice has been paid to their efforts. Deans in colleges and faculty advisers likewise have reported that college studies fail to arouse intellectual interests in students, and the Association of University Professors has for several years had a committee at work with a view to discovering methods of increasing intellectual interest and raising the intellectual standards of undergraduates.

The second group of critics comprise psychologists who point to the abundant evidence of the amount of individual differences in tastes, as well as powers, among college undergraduates and complain that the provision for this diversity of interests and capacities is inadequate. It also includes sociologists who direct attention to the far-reaching social changes that have occurred in the last two decades and the profound modifications in the activities of women that have taken place. They evaluate the curriculum in the light of these marked events and contend that much that is now being taught is relatively unimportant, while much that should be taught is withheld. The theory that the college should prepare for complete living few would deny. The method of determining what specific experiences should be provided to attain this end is not a simple matter. Charters has followed a plan of having graduates of superior capacity keep daily records of their activities in order to

ascertain what should be taught in college to fit women better for their future responsibilities. Few intelligent women, however, in this transition period, would accept it as axiomatic that women's present activities have attained a sufficiently high level to warrant their being perpetuated by building curricula for colleges on such a foundation.

The establishment of the Institute for the Co-ordination of Women's Interests at Smith College is based on an admission of ignorance of what ought to be and a plan to study conditions with a view to their amelioration. This is a more sound position. It is

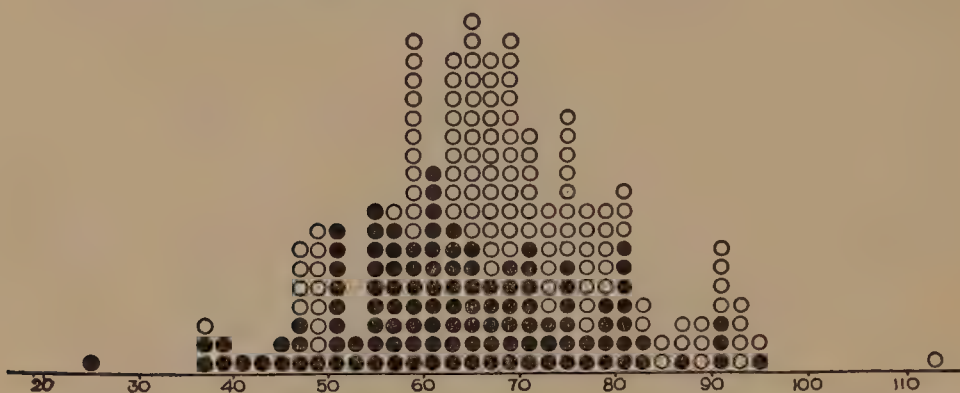


FIG. 1.—Intelligence scores of students, class of 1919-23. Total elimination during four years indicated by black circle; students completing college course, white circle.

not self-evident what knowledge is of most worth for women, particularly as the sphere of women's activities is changing rapidly. We have to deal with complex variables, which makes it difficult to select appropriate studies. Such an institute has as one of its objectives the investigation of a possible reconstruction of society, so that married women can engage in professional work without the severe handicaps that exist at present.

From the consideration of current criticism of colleges of liberal arts and of the interesting administrative changes that already have been embarked upon in individual institutions it is apparent that bolder experimentation is hoped for. The need for innovation is more strongly suggested by a study of college failures. Such a study should be helpful in throwing further light on the salient facts and by adding objective evidence to the wealth of subjective

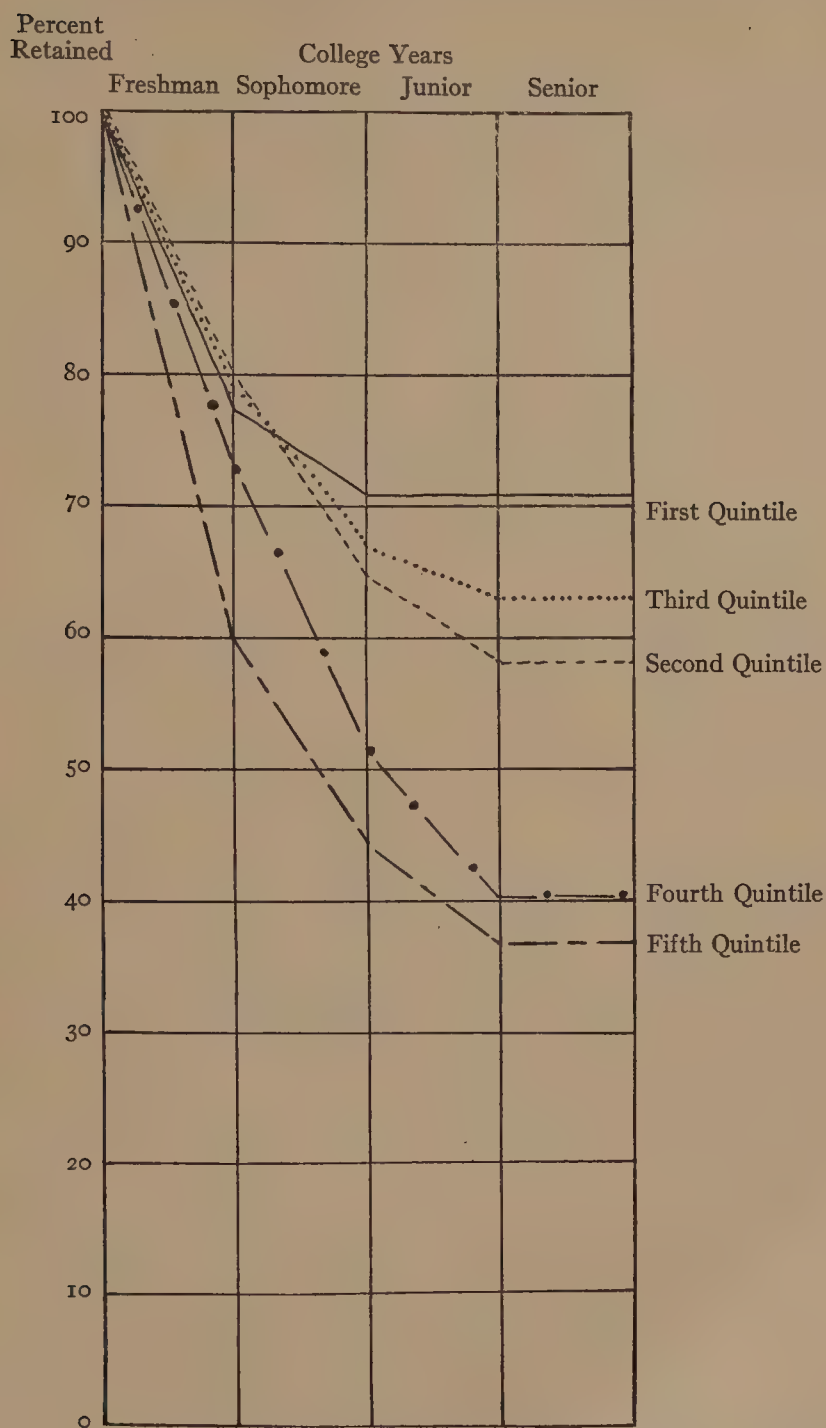


FIG. 2.—The relative amount of elimination from quintiles on the Thorndike Intelligence Examination, Goucher College, class of 1919-23.

opinion. Facts already published¹ will be summarized, and pertinent conclusions drawn.

A group of 254 students belonging to the 1919-23 class of Goucher College was studied. This institution admits by means of the method of certification. It is sufficiently similar to a large number of institutions for the higher education of women to furnish results of value for a study of elimination. The most important facts are as follows: Of the original number who entered, 46 per cent withdrew prematurely (see Fig. 1). Of those who were eliminated, 44 per cent departed without offering a reason for withdrawal. Sixteen per cent of eliminants were dropped on account of poor work.

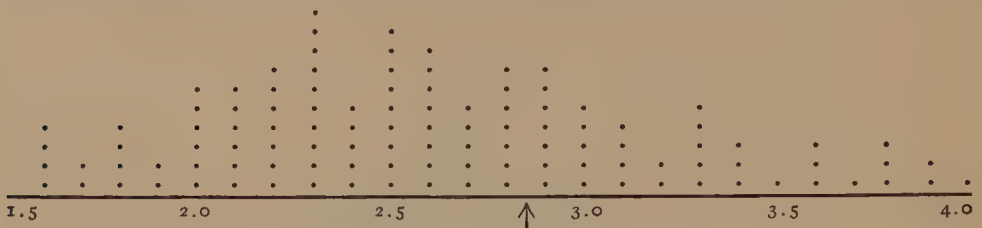


FIG. 3.—Academic grades of eliminants. The central tendency in academic grades for the whole class was 2.89, as indicated by the arrow.

Intellectual ability was a significant factor influencing stay in college. Thus 60 per cent of those who withdrew had scores on the Thorndike intelligence examination in the lowest third of the class. It is noteworthy, however, that 20 per cent had scores in the highest fifth of the class (see Fig. 2). Moreover, many of them made academic records above that of the lowest third (see Fig. 3) and such grades were presumably not the result of enormous exertion of effort, since 32 per cent, approximately, of those who withdrew early had not only college marks, but also intelligence scores above the lowest third, and 25 per cent of them had both intelligence scores and college grades superior to the average. It may be granted that a satisfactory record can be achieved by a student above the average on the intelligence examination without severe effort.

It was also found that poor preparation influences stay in college,² since students entering with conditions leave college in larger

¹ Agnes L. Rogers, "The Causes of Elimination in Colleges of Liberal Arts for Women," *Educational Administration and Supervision* (March, 1926).

² Agnes L. Rogers, "The Intelligence Level and Academic Attainment of Conditioned Students," *Educational Administration and Supervision*, X, No. 6 (September, 1924), 395-98.

numbers than regularly admitted students. Fifty-three per cent did not complete the course, whereas only 38 per cent of ordinary students did not graduate (see Figs. 4 and 5). Of those admitted on probation, 37 per cent had intelligence scores superior to the aver-

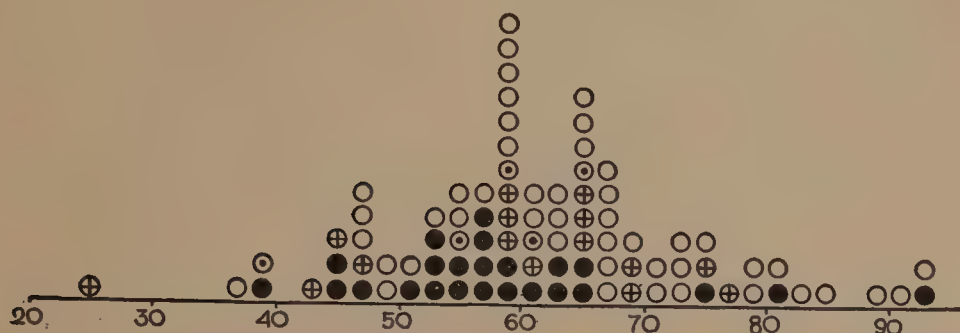


FIG. 4.—Intelligence scores students (admitted on high-school certificate having completed one unit less than full course of fifteen units) on probation I (1919-23). Students eliminated during first year indicated by black circle; students eliminated during second year, crossed circle; students eliminated during third year, white circle.



FIG. 5.—Intelligence scores of students (prepare for college in some irregular manner) on probation II (1919-23). Students eliminated during first year, indicated by black circle; students eliminated during second year, crossed circle; students eliminated during third year, white circle.

age college student. Poor preparation is thus a handicap. The amount of elimination due to ill health, death, marriage, and transfer to other institutions is comparatively small, and after all factors have been taken into account, we find still that 25 per cent of those who withdrew without a degree had enough intelligence and a sufficiently high academic record to justify their continuance in college work.

These results point to the absence of a dynamic appeal in the

college curriculum itself. It is practically certain that many women leave college prematurely who have sufficient ability and industry to graduate and who do not withdraw on account of ill health, poor preparation, or for financial or family reasons. The number of parents is increasing who wish to educate their children beyond high school, and this seems likely to continue. It is a product of the general economic prosperity and has affected secondary and college education to a marked extent. The high-school population is six times as large as it was in 1890, and has increased much faster than the general population. Similarly, college students now are 5.7 per thousand of the population; in 1890 they were 3.8 per thousand. We have barely begun to educate the proportion of the population that is capable of profiting by college training. Book³ has shown that 22 per cent of A+ students and 24 per cent of A students in the state of Indiana did not intend to continue their education beyond high school. Colvin and MacPhail⁴ have likewise stated that the percentage of high-school seniors in Massachusetts who are not planning to go to college, whose scores in intelligence examinations are equal to, or surpass, that of the median Brown University Freshman, was fourteen. Smith⁵ reports that 34 per cent of students who did not return to the University of Wisconsin in one year could have done so, and that women tend to withdraw in larger proportions than men.

Thus the amount of withdrawals that occurs in a variety of institutions and the intellectual caliber of the eliminants challenge the present curriculum. It is not possible to explain the heavy elimination as due to lower mental capacity in those now being admitted. The key seems to be that interest is not sufficiently great to hold the student for four years. It is probable that persons from families and schools without scholarly traditions swell the number of those who withdraw early, and that large institutions have not the hold over students that smaller colleges obtain.

³ W. Book, *The Intelligence of High-School Seniors* (New York: Macmillan, 1922), p. 38.

⁴ S. S. Colvin and A. H. MacPhail, *Intelligence of Seniors in the High Schools of Massachusetts*, U.S. Bureau of Education Bulletin No. 9 (1924).

⁵ C. A. Smith, "Why Students Leave College," *Educational Administration and Supervision*, LX, 339-44.

It seems timely to launch a new institution that would remedy the present method of treating alike women who plan to enter the professions, women who are preparing for the noble enjoyment of leisure, and those who are sent by their parents merely to spend four agreeable years in pleasant surroundings. Much could be said on behalf of the junior college. Students who leave by the end of the Sophomore year lose much by being in an institution which is highly integrated. The very unity of the college curriculum is disadvantageous to them, since most first- and second-year courses are planned for students who are to stay for four years, and often for students who are to specialize in the field. A course for those who are to give three years to the study of a subject naturally should differ from that which is to be the sole formal instruction that will be taken in that field. Where transfer is made simple for those who later decide to go on farther, such an institution seems to serve a valuable purpose.

More, however, is demanded. It would seem appropriate to have a college for women in which requirements should be related clearly to present and future interests; one that will stress, therefore, the social studies and the fine and applied arts and demanding in these fields as strenuous application of mental powers as is now required in college studies. Such an institution should not be a refuge for those who have not enough brains to enter Vassar or Bryn Mawr. As high a standard of attainment in their chosen field of work and as strenuous a working day should be required as is now exacted of the average or superior student in the college of liberal arts.

Either colleges must grow in size so as to become a group of colleges, each with its own social life and the whole institution providing for the higher education of women of superior ability and widely varying tastes, offering instruction in the fine arts and music, the applied arts, and child psychology, as well as English, economics, and other valuable studies for modern life, or colleges must each render a distinctive service and limit their field of work to specific ends. Some may continue to provide the basal preparation for the professions of law, medicine, and teaching for those women who have already decided on a career in these. Such women form

only a fraction of present entrants, but even now represent a significant one in size.

The chance of a fresh start is the greatest desideratum. One can with difficulty graft new curricula on old institutions. The purpose of education is conservation of the social inheritance, and it will always be hard for devotees, each in his own subject, to treat it as on a par with the rest, still less to see it losing ground. Changes we now try to introduce with great difficulty could be quickly accomplished by selecting a group of teachers whose convictions are in sympathy with such a theory of the higher education of women. A college faculty is an organic growth, and cannot be reconstructed overnight. The traditions of all institutions are slowly modified, and change of regulations by vote frequently makes little real difference in student experience. A fresh start would cut this Gordian knot that "slow tradition binding fast" has wrapped around the colleges of liberal arts for women.

VIII. THE WHOLE VERSUS PART METHODS IN LEARNING: COMPARISON AND SUMMARY

L. A. Pechstein

The interest of the writer in methods of learning involving such factors as varying modes of attack upon the constituent units of an entire body of learning material was at white heat ten years ago. At that time there was published a monograph devoted to an investigation in the field of motor learning.¹ Groups of college students and white rats were taught mazes under conditions highly comparable. At a later time further experimentation directed attention to the relation between massed and distributed learning in connection with the whole-part methodology.² Still later procedures and methods previously employed in motor learning were following in learning verbal material of both nonsensical and quasi-meaningful character.³ Results have long since been published, and the attention of the writer turned to other things. Nevertheless, he has often noticed that most recent textbooks in psychology continue to stress the superior virtues of the whole method in learning, leading him to wonder whether his results were not considered conclusive or else whether the psychologists were not familiar with them.

Reed and Brown have recently stirred the waters into activity, and the writer's original interest of several years ago has come again to the surface. The present paper is to present briefly a research by one of his graduate students, this extending the general research sequence into the field of learning meaningful verbal material verbatim.⁴ After this is reported, the results from all the

¹ L. A. Pechstein, "Whole Versus Part Methods in Motor Learning: A Comparative Study," *Psychological Review Monograph Supplement*, XXIII, No. 2, 59 ff.; "Alleged Elements of Waste in Learning a Motor Problem by the Part Method," *Journal of Educational Psychology*, VIII (1917), 303.

² L. A. Pechstein, "Massed Versus Distributed Effort in Learning," *Journal of Educational Psychology*, XII (1921), 92 ff.

³ L. A. Pechstein, "Whole Versus Part Methods in Learning Nonsensical Syllables," *Journal of Educational Psychology*, IX (1918), 387.

⁴ E. A. Dolan, "A Study in Learning," unpublished research in partial fulfilment of M.A. requirements, filed in Library, University of Cincinnati.

writer's experiments will be made the subject of generalization. There will be included the results for lower animal and human learning, as well as results secured by various methods with the motor, nonsensical, and meaningful types of learning materials.

LEARNING MEANINGFUL MATERIAL VERBATIM

a) Conditions for the experiment.—In the attempt to carry the investigation into concrete classroom situations, learning subjects were employed from typical eighth-grade classes in a large elementary school (Mary Dill School, Cincinnati, Ohio). Twelve learners were selected and divided into two groups. Group I consisted of three boys and three girls whose intelligence quotients ranged from 125 to 136. Group II consisted of three boys and three girls whose intelligence quotients ranged from 80 to 93. As far as the writer knows, this is an original attempt to determine the relation between intelligence levels and learning under the whole-part methodology.

The material selected for learning had to lend itself to whole and part methods and had to be suitable to the subjects tested. It had to be such that could be comprehended by eighth-grade students, and had also to be unknown to them. After considerable try-out, certain portions of Scott's *Lay of the Last Minstrel* were selected. These were chosen in such a way that as far as possible a complete unit of thought was included within the number of lines selected as a unit of learning. Twenty-eight such selections were made. The first eight of these contained 6 lines each. Varying lengths of learning units, with the frequency of each type, were as follows: four of 8 lines; four of 12 lines; four of 14 lines; two of 16; four of 18, and two of 21. The twenty-eight selections were mimeographed in quantity, each one bearing the number of the selection. They were mimeographed according to two styles: whole, and parts. The parts were divided into stanzas with a two-inch space between stanzas, so that the papers could be folded, allowing only one stanza to be seen at a time.

Each group of students reported at the same time each morning, the brighter division at 8:45, and the slower at 9:15. The time, place, group, and instructions were kept constant from day to day. Learning and testing were continued at the same hour and place,

five school days per week. No one was allowed to enter the room during the learning work, and the entire exercise was conducted by the one research student. Each morning the children were given their proper learning assignment according to the method marked for the individual child for the particular day. As to methods, the following were employed:

1. *Whole*, which was a straightforward reading of the entire body of material each time until verbatim mastery was attained.

2. *Pure part*, which was reading each stanza as a separate unit without any review until learned, then the final connection of the units into a whole.

3. *Repetitive part*, which was a repetition of the units already learned as parts preceding each reading (learning) of the new part, continuing until the whole was learned.

TABLE I

	METHOD				
	Whole	R.P.	P.P.	P.	Total
Group I:					
Number of subjects.....	9	2	0	31	42
Group II:					
Number of subjects.....	5	4	1	22	42

4. *Progressive part*, which was a study of each unit until learned, then followed by its immediate connection with all that had been previously learned.

By first arranging a learning program for each child to follow during the entire experiment, it worked out that each pupil learned each selection, studying seven times by each method, yet with the methods so rotated that practice effect and other factors were distributed and controlled. The attitude of the learners and the controlled conditions of the experiments left little to be desired.

b) *Findings in learning poetry verbatim*.—In securing the results of learning poetry verbatim it was found necessary to give up the attempt to make a valid comparison in terms of repetitions or learning trials, since the pupils showed inaccuracies in making a recording mark each time they had read through the unit or entire section upon which they were working. Subject to this questionable fact, therefore, Table I shows results of the fewest repetitions for

each of the six subjects of Group I and Group II in the seven various lengths of poems.

Certain other helpful comparative measures are determinable:

1. The shortest time made for each of the six subjects in each of the groups in learning each of the seven varying lengths of poems was determined. This gives the number of selections won by each learning method. This is as follows (Table II), distributed for the superior and inferior mentality groups, respectively:

TABLE II

	METHOD				
	Whole	R.P.	P.P.	P.	Total
Group I: Number of subjects.....	11	14	7	14	46 (4 ties)
Group II: Number of subjects.....	7	14	13	8	42 (0 ties)

2. The average time in seconds, and average repetitions according to the different methods for each set of poems, follow (Tables III and IV). The shortest time for each group for each set of poems is starred, making a total of fourteen. The totals (Table IV) show the number of times a method scored the shortest time.

Various other methods of tabulating the learning data agree with the foregoing in pointing out two very definite conclusions:

1. Some form of the part method is best for this type of learning.

2. The intelligence quotient is an essential factor in learning, learners of high intelligence being better able to employ the whole method successfully than are the learners of lower intelligence levels. The lower the level, the more difficult to learn by the whole method, and the more ineffective it becomes.

c) *General summary.*—What conclusions may be drawn from all the experimental work done on the problem? How universal may generalization be made? The writer submits the following as items of a general summary to cover the entire range of experimentation, holding for motor, quasi-meaningful, and logical material of poetry type, for animals and humans, and for varying levels of intelligence:

1. Some form of the part method is more effective than the whole. This is universal for animal and human learning, and for motor, quasi-meaningful, and meaningful material.

2. The progressive and repetitive part methods seem the most effective of the modified part methods employed.

TABLE III*

No. OF POEMS	No. OF LINES	GROUP	WHOLE		R.P.		P.P.		P.	
			Sec.	Rep.	Sec.	Rep.	Sec.	Rep.	Sec.	Rep.
8.....	6	I	420.83	19.91	405*	17.42	436.66	19.21	431.08	13.4
		II	873.75	21.5	898.63	24.78	845.76	19.53	823.75*	13.14
4.....	8	I	763.33*	22.5	825	25.37	851.66	25.45	810	16.91
		II	1,173.5	26.83	942.5*	22.25	1,172.5	22.75	1,065	13.2
4.....	12	I	900.83	20.83	940.83	23.94	1,035.83	26.66	881.66*	12.83
		II	1,768.33*	35.33	1,997.5	37.63	2,016.66	39.55	1,810.	18.83
4.....	14	I	1,302.5	27.83	1,145	31.17	1,290	29.71	1,122.5*	16.16
		II	2,468.33	35.	2,051.66*	24.96	2,136.5	36.63	2,102.5	23.95
2.....	16	I	1,325	24.66	1,260*	33.2	1,778.33	36.47	1,690	21.85
		II	1,956.66	28.33	1,950*	29.52	2,160	26.93	3,375	16.20
4.....	18	I	1,509.18	28.66	1,425	21.20	1,417.5*	37.79	1,750	21.35
		II	2,885	38	2,152.5*	29.93	2,368.66	26.79	2,297.5	12.48
2.....	21	I	1,810	29.33	2,190	44.80	1,736.66	51.32	1,640*	15.56
		II	2,930	34.33	2,308*	21.17	2,318.33	25.8	2,805	15.27

TABLE IV*

NUMBER OF TIMES EACH METHOD SCORED SHORTEST TIME

Group	Whole	R.P.	P.P.	P.	Total
I.....	I	2	I	3*	— 7
II.....	I	5*	0	I	— 7
Total.....	2	7*	I	4	— 14

* Numbers followed by star indicate shortest time for each group for each set of poems.

3. The harder the problem, the more essential to break its learning into parts; massing the learning effort is of value with the use of part methods; massing is disastrous with the whole method.

4. In corollary to the above for humans, the lower the I.Q., the greater the inefficiency of the whole method; the higher, the greater its efficiency, although it rarely with an individual, and never with the entire group of high I.Q. learners, surpasses certain forms of the part method.

5. The factors of attitude, emotion, knowledge of results, etc., are powerful. The law of effect is probably underestimated in potency; frequency, overestimated.

6. Part methods are most advantageous during the discovery or eliminative stages of learning; the whole method, for the final mechanization.

The preceding summarized series of experimentation does not include results gathered in the field of learning prose. This is now being investigated. The writer is likewise giving attention to a recanvass of the laws of learning, with an endeavor to discover whether the suggestion in point 5, preceding, is valid. The last cycle of the experimentation in the field of classroom learnings seems to emphasize in striking fashion the importance of the attitudinal or effect factors, as well as the relation between mental level and method of learning employed.

THE NATIONAL SOCIETY OF COLLEGE TEACHERS
OF EDUCATION
CONSTITUTION

REVISED TO MARCH, 1925

ARTICLE I. NAME

This association shall be styled The Society of College Teachers of Education.

ARTICLE II. PURPOSE

It shall be the purpose of this Society to promote and improve the teaching of education in the colleges and universities of the country. The Society recognizes three general fields for its operation as follows: (1) Problems of the administration of departments of education, (2) Problems of the teaching and organization of courses in education, and (3) Problems of research in the general field of education.

ARTICLE III. MEMBERSHIP

SECTION 1. Membership shall be confined to teachers and administrators in recognized colleges and universities who are engaged in teaching and research in education.

SECTION 2. All those persons who were in attendance upon the first meeting in Chicago, and who shall sign this constitution and pay the membership fee, shall be regarded as charter members. All other members shall be elected by the Executive Committee.

SECTION 3. Members shall be elected by the Executive Committee, and shall pay annual dues. Other funds necessary for the maintenance of the society shall be raised by assessments levied on the members of the society.

ARTICLE IV. OFFICERS

SECTION 1. The affairs of the society shall be placed in the hands of an Executive Committee consisting of the president and secretary during their terms of office, the retiring president and

secretary for one year from the date of their retirement, and three other members of the Society, each for a term of three years, one to be elected each year at the annual meeting. The president shall preside at the meetings of the Society, and the secretary shall assume all the duties usually devolving upon such an officer. In addition, he shall take charge of the funds of the association and expend them under the direction of the executive committee. The president shall be elected annually and the secretary for a term of three years, by the active members of the society.

SECTION 2. The Executive Committee shall have power to fill vacancies occurring in the offices of president or secretary-treasurer.

ARTICLE V. MEETINGS

There shall be one meeting of the Society each year, to be held at the same time and place as the meeting of the Department of Superintendence of the National Education Association until otherwise determined by vote of the Society. The Executive Committee shall have charge of all details in arranging for each meeting.

ARTICLE VI. AMENDMENTS

Amendments may be made to this constitution by a two-thirds vote of the members of the Society at a meeting subsequent to that at which the amendment has been proposed in writing.

ARTICLE VII

By-laws may be adopted or amended at any annual meeting by a two-thirds vote of active members present and voting.

BY-LAWS

1. The Executive Committee is authorized to appropriate such sums as may be necessary and available from the funds of the Society for secretarial help in the conduct of the work of the secretary.

2. The Society shall defray the necessary expense of the secretary, including travel, at the annual meeting.

3. In the election of members into the Society the Executive

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- As viewed from the standpoint of the state university school of education, DEAN WILLIAM F. RUSSELL, College of Education, University of Iowa.
 - As viewed from the standpoint of the state teachers' college, PRESIDENT D. B. WALDO, State Teachers' College, Bellingham, Wash.
 - As viewed from the standpoint of the city teachers' college, DEAN AMBROSE L. SUHRIE, Cleveland School of Education.
- "The Principles Underlying Curriculum Construction for Schools of Education," PROFESSOR ARTHUR J. JONES, School of Education, University of Pennsylvania.
- "The Determination of Curricula for the Education of Teachers of Elementary Schools," PROFESSOR E. GEORGE PAYNE, School of Education, New York University.
- "The Determination of Curricula for the Education of Teachers of Secondary Schools," PROFESSOR W. C. REAVIS, School of Education, University of Chicago.
- "The Value of the Study of the Philosophy of Education in University Schools of Education," PROFESSOR W. H. KILPATRICK, Teachers College, Columbia University.
- "The Professional Education of Teachers in Normal Schools and Teachers' Colleges," PROFESSOR W. C. BAGLEY, Teachers College, Columbia University.
- "The Professional Education of College Teachers," PROFESSOR W. W. CHARTERS, University of Chicago.
- "Educational Research in University Schools and Colleges of Education," PROFESSOR R. B. BUCKINGHAM, College of Education, Ohio State University.
- "The Case Method in the Study of Teaching and Its Value in the Professional Education of Teachers," PROFESSOR WILLIAM P. BURRIS, Teachers' College, University of Cincinnati.

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- "Discovery and Formulation of the Objectives," PROFESSOR FRANKLIN BOBBITT, University of Chicago.
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- "Job Analysis in Teaching," PROFESSOR F. B. KNIGHT, University of Iowa; PROFESSOR LEONARD B. KOOS, University of Minnesota; DEAN ROBERT J. LEONARD, Teachers College, Columbia University.
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- "A General Survey of the Curriculum Situation," DIRECTOR J. K. NORTON, Research Department, N.E.A., Washington, D.C.
- "What Can Motion Pictures Contribute to Education?" PROFESSOR E. N. FREEMAN, School of Education, University of Chicago.

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- Report of Committee on Teacher-Training Curricula, W. W. CHARTERS, University of Chicago.
- "An Experiment with an Objective Scale for Elementary Teacher Rating," FLORENCE E. BAMBERGER, Johns Hopkins University.
- "Research on the Part of the Classroom Teacher and What It Can Do for His Teaching," R. M. STEWART, Cornell University.
- "The Public-School Teacher as a Research Worker," B. R. BUCKINGHAM, Ohio State University.
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